THE INDUSTRIAL-ARTS MAGAZINE

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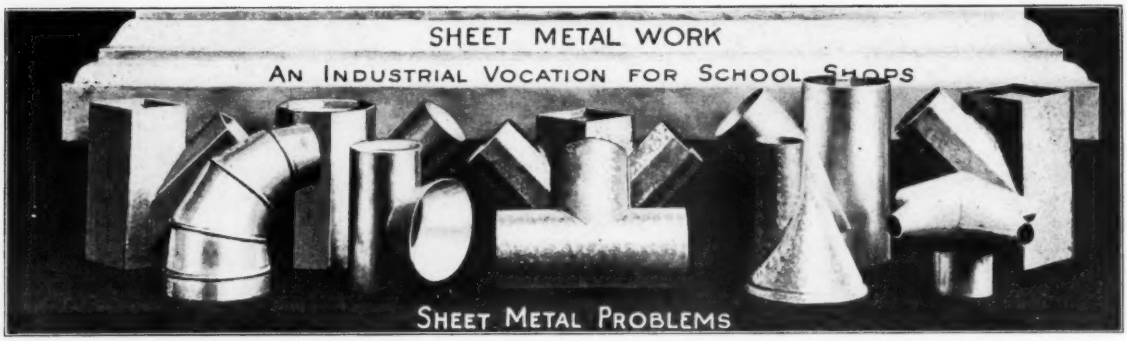

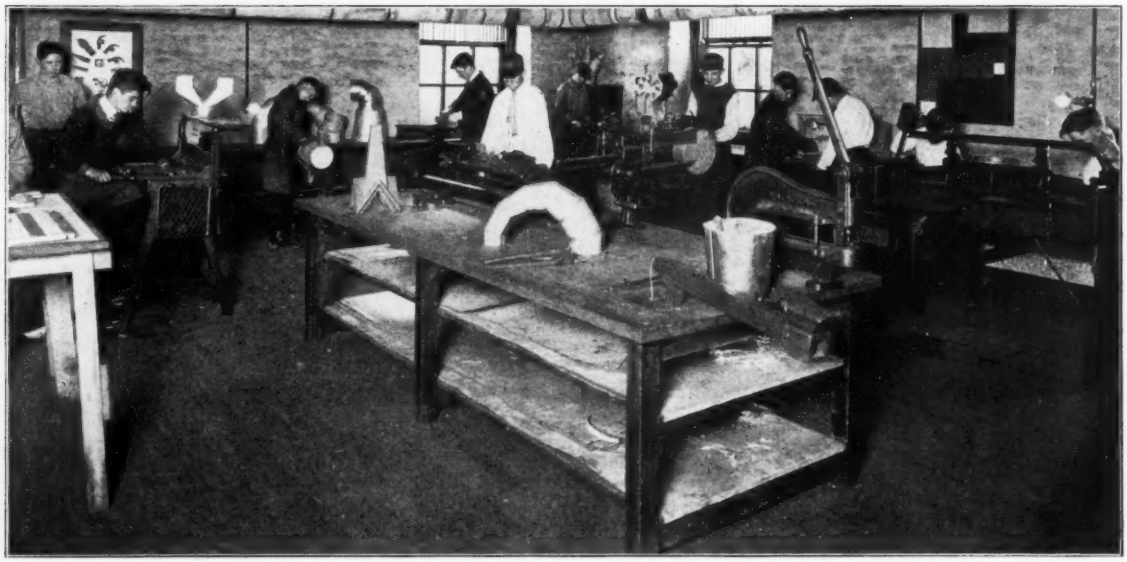

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INDUSTRIAL-ARTS MAGAZINE

Volume X APRIL, 1921 Number 4

Suggested Courses for Foremen Training Classes

James McKinney, Assistant Professor of Industrial Education, University of Illinois

POINT OF VIEW IN ESTABLISHING A COURSE OF STUDY.

MANY attempts have been made to establish classes of various kinds for the benefit of workers in industrial plants. Some of them have been successful, and others have, on the other hand, been complete failures. It is rather a curious commentary on human nature and also shows how strong a hold our past experiences have on us; as we find that when the corporation school made its first attempt to establish training for its workers it very frankly said that the public school was not meeting its needs. They accused the public school of giving children a lot of education which seemed to fit no one for anything in particular. They rather harshly told the schoolmaster that his product could not read, write or figure with any degree of accuracy, and yet when we examine the courses of study which have been developed in factory schools, we find a great similarity to the thing which they so severely criticised. Their courses of study are often patterned very much after the courses in our public schools. In fact, the interest in going to the factory school has been no greater than that of attending public school, and in some cases young men and women have actually "thrown up" good jobs rather than be obliged to attend the factory school. In establishing work of this kind one has to hold fast to some of the fundamental principles of education, as learning by doing; of progressing from the concrete to the abstract; of stimulating the learner to think and make accurate judgment; and then forget very largely how we ourselves were taught.

The Problem of the Foreman Course.

The problem of training foremen has all the difficulties of the corporation school for the worker plus some new and peculiar problems of its own. To suggest that the foremen are ignorant and require training would immediately spell disaster for the whole scheme. The problems must be tackled in an absolutely open manner with "all the cards on the table face up." Foremen themselves must realize a real necessity for taking training or else there is no use in starting classes. If the work which is suggested will not make the man feel he is to become a better and more valued worker, the starting of a class had better be delayed.

There are two distinct phases in the matter of training foremen; one, which we might call trade extension work, has to do with getting a better and more scientific understanding of the production job; the other, which we might call for want of a better term, instruction training, and has to do with the whole matter of giving instruction about new processes to learners and the general problem of giving instructions about work.

I. Trade Extension Work.

Production problems; planning, routing, scheduling, executing, dispatching, standards, etc.

Related technical subjects as mathematics, drawing, science, English, etc.

Just what the foreman has to know about the production problems will have to be determined by the factory executives, and perhaps the best man to teach this material is someone on the executive force who has a very good grasp of this problem and who has taken some teacher training. The method for carrying out this work will very largely have to take the form of discussions on practical problems of the plant, that is, the men themselves who are taking the course will bring in problems and discuss them with this executive. This plan, as it were, "kills two birds with one stone" because the executive will be able to get the sympathetic backing of the foremen for the factory organization thru this method, and at the same time be able to get instructive criticism of the plan, as these men are after all the ones who actually carry the plans into operation and are therefore likely to see where they do not actually work efficiently. Each one of the items mentioned above could be taken in this manner with a series of problems suggested for discussion with the men.

When it comes to the matter of the related shop studies, here is where the analysis of subject matter will have to be gone into with great care, as it is on this point that most of the corporation schools have fallen down. Their work has been too formal. It has failed to raise any or much enthusiasm, "to know how and why" about the shop work. It has dealt too largely with giving mere information and not presenting enough real shop problems for study and solution. The subjects of mathematics, science, drawing, English, etc., have been treated too much as subjects and not enough as *tools*

for solving and understanding the problems of the shop. The one test that ought to be in front of the people who are establishing the content of the course is one of, Where does this information actually function? On what job is it actually used? Will it make the worker take a larger and more intelligent interest in the job? This course of study cannot be laid out by any one man and ought to be settled upon in joint conference with the foremen, some of the executives, and the director in charge of the training work.

It is easy to draw up a course of study like the following, and say that this stuff will be *good* for the apprentice, mechanic or foremen.

Mathematics.

Common fractions. Decimal fractions. Ratio. Proportion. Percentage. Simple equations. Use of formulae. Measurement of angles. Square root. Solution of right angle triangles. Making and reading of graphs. Mechanics as applied to Force, Motion, Levers, Pulleys, Wheel and Axle, etc. General laws of Work, Energy, Power.

Such a course might serve the purpose of a technical high school, where the attendance is a matter of compulsion, but it will not serve the purpose of a corporation training course where men are independent and really know what they want. The needs of the plant will be met more successfully if forms are drawn and an analysis made of: first, jobs; second, mathematics required to do this job; third, any special mathematical devices such as tools, instruments, formulae, handbooks, etc., which are used in the factory. The mathematics then become a necessary tool for completing a job satisfactorily, or a basis of understanding with some intelligence on how it was done.

Science.

The same general point of view would be prominent in science, that is, an analysis of the science factors that a foreman requires to know to carry on his job effectively would be made, and each of the following items could be studied with this idea in mind:

(Terms applicable to matter, certain kind, conditions.

Matter
- Forms
  - Liquid.
  - Gas.
  - Solid.

Mechanics
- Law of Motion.
- Friction.

Lubricant
- Oils
  - Vegetable.
  - Animal.
- Grease.
- Viscosity.
- Flash and fire test.
- Solid.
- Graphite Tale.

Heat
- Measurement.
- Change in dimension.
- Co-efficient of expansion.

Metallurgy
- General properties of metals.
- Process of manipulation.
- Lead, tin, solder,
- Bearing metals, brasses,
- Babbet, aluminum.

Strength of Materials.
- Strength of metals.
- Elasticity.

Stresses
Tensile
Torsional
Shearing
Transverse
Compression

Centrifugal Force
- Fly wheels.
- Abrasion wheels.
  - Bonds
  - Grain
  - Grade
  - Kinds

Electricity
- Magnetism.
- Theories of magnetism.
- Dynamos.
- Motors.
- A. C. & D. C. current.
- Amperage volting circuit.
- Dry Cells, wet cells.
- Induction coil.
- Electric furnace.
- Electric welding.

This example will be concerned with men who are engaged in machine shop practice, but other similar studies could be worked out for men in different trades.

With regard to English, the same point of view of analysis to determine where the matter functions holds again.

(1) What demands for written work are made of the foreman on his job?

(2) Outside of his job?

The following ideas are given for a closer study on English; topic being the idea which is in the teacher's mind; problem being that which the class or group will face.

English.

Problem.		Topic.
Shop magazine reading.	1.	Trade literature (reading) note clearness, proper use of tenses, punctuation, meaning of words, and spelling.
The use of trade books and handbooks.	2.	Trade literature.
Describing a simple shop operation.	3.	Oral composition. Description.
Explaining the why of some shop job.	4.	Oral composition. Explanation.
Reporting a shop accident.	5.	Oral composition. Narration.
The pros and cons about some new shop plan.	6.	Argumentation.
Describe in writing some of the measuring tools.	7.	Simple description of tools.
Describe in writing a simple bench operation.	8.	Composition. Clearness, proper use of tenses, punctuation, spelling.
Describe a laying out process.	9.	Composition. Unity, coherence.
Letter writing.	10.	Composition.
Several topics as ordering tools, etc.		Paragraphing and clearness.
Make an outline of a process embodying a number of steps.	11.	Composition. Outline.
Make a complaint about the filling of an order.	12.	Business correspondence. Brevity. Clearness. Tone, courtesy.
Make an application for a position as a foreman.	13.	Business correspondence. Applicant's qualifications.

The main idea underlying all the work is to bring out the idea of clearness, right meaning of words, proper tenses.

By reading good English, the men will see these things in their right relationship.

Some simple rules of speech may be given in mimeograph form and will constitute the authority or "rules of the game."

Drawing.

Again, we shall start with the analysis of what does the foreman in your plant have to know about drawing.

(1) Ability to make freehand sketches.

(2) Ability to make mechanical drawings or do drafting.

(3) Ability to read blueprints.

(4) What information does the man actually get and use from the blueprints that come into his hands?

Breaking up a Course of Study Into Short Units.

After the analysis is made, and the specifications for the content of the course settled, the real problem in breaking up this content into suitable units of instruction becomes evident. There is no reason for each man taking the whole of any one course which is suggested. Some men, for instance, might know all they are required to know about drawing; again, some men might know, for practical purposes, a good part of the English course and would like very much to take only a part of the English course. This being the case, units of instruction should be arranged so that is is possible for a man to take single courses or parts of any one course.

II. The Instruction Job.

The writer feels that this part of the job is a distinct new trade process for the foreman to learn, and therefore has to be tackled from the point of view of actually learning a new trade. Some men have, of course, been doing good work on this side of their job, but it has been done very largely on the basis of trial and error method, and very often they have succeeded in doing a piece of good work simply because nature had endowed them with a likeable disposition. The following outline of a course of study is suggested for this part of the foreman's job which has to do with instruction:

1. Analysis of what the foreman has to teach learners.
   - (a) Production job
     - Tool operations.
     - Assembling.
     - Miscellaneous.
   - (b) Technical job
     - Trade drawing.
     - Trade mathematics.
   - (c) Auxiliary Information
     - Working properties of materials.
     - Safety first.
     - Information about tools and machines.
     - Trade terms, plant regulations, etc.
2. Getting a routing plan of instruction for the learner.
   The question of learning difficulties and production difficulties.
3. Method of Instruction.
   1. The instructing job a different job from the production job.
      Production turns out finished goods.
      Instruction turns out good worker.
   2. The operation steps in an instruction job.
      The worker's line of thought.
      The foreman's line of thought.
      The difference between telling and showing and real instruction.
      The trial and test of the learner.
   3. Supervised instruction on the job.
4. The art of being a Leader or "Boss."
   1. The relation between foreman and worker.
   2. Organization for handling different types of instruction.
   3. Group and individual instruction.
   4. Instruction conditions.
   5. The factors of attention and interest.
   6. The place of theory and practice.
   7. Keeping instruction records.

Method of Carrying out Suggested Plan.

Of course, the whole success of any such instruction plan will hinge entirely upon the kind of men who are to be the teachers in these classes. Here the writer will suggest some plans which he believes will work out if they are given a fair trial. Before any such work is attempted, the management ought to have in their training department a man who has had factory experience and who is also strong on the instructional side of the work and familiar with the vocational education problem. This man should, with the help of the management, pick out from the plant one or two men who are strong on production and technical problems and give these men special training on how to teach effectively. Failing in this, vocational teachers from outside of the plant could be selected and given special training on putting over the teaching plan. After this course has been completed and the teachers prepared for their work, the related shop study classes for the foremen could be organized and started. At the same time, the specialist in vocational education should also organize classes on the instruction problem and carry these out himself. After the work is completed, classes to make the workers more efficient can be started, carrying out the same general plan and method. The foreman works in close cooperation with the teacher of the related subjects and is responsible for the shopwork.

The Success of a Training Plan.

To train the foreman as an instructor is a first essential to any successful scheme for training the workers. Your trained foreman will be an invaluable help to the learner, as he will now fully realize his part in the training plan. He will see the shop job as a part of the educational process. The change in point of view will make him a real guide and counsellor to the workers who are anxious to struggle ahead and "make good."

As a final word the writer is going to emphasize the need of caution in going ahead with this kind of work. Everybody seems to think that it is quite easy to do and offers a great field. Foremen training is a great field, but nothing should be attempted until a careful preliminary study of the situation has been made.

Such a scheme of training will not solve all the "ills" that pertain to industry, but it is a scheme of education which will keep the mind of the worker turned *towards his work* instead of *away from it*, and provide an active brain with some food for thought on the problem of finding out "how" and "why" about the job instead of brooding over real and apparent social wrongs, will do much to act as a stabilizer in our maelstrom of political and social unrest.

GLOUCESTER
HARRY W. JACOBS.

PENCIL SKETCHING—Part II

Harry W. Jacobs, Director Art Education, Buffalo, N. Y.

IN the opening article on Pencil Sketching in the February issue, we discussed the materials used and illustrated a variety of strokes by many sketches that are well adapted to this particular medium.

When the teacher and student have acquainted themselves with the materials, and practiced the various strokes, we are ready to attempt some simple subject as a sketch.

In selecting our first sketch, it is best to choose one that is simple in character, that is, the drawing must not be too difficult, the planes of the masses must be large, with little detail, and be easily selected, and the subject in general present a pleasing composition. With these stipulations in mind, it is best to present to the class or individual, a number of prints of one subject, that they may all work out this first problem as a class, thus gaining by observation and criticism the work of the class in general.

A group of small houses at Lanesville, Gloucester, Mass. (halftone illustration), which was photographed last summer with this particular use of the subject in mind, will serve as a subject for our first sketch.

Emphasis should be laid on the use of the camera as an excellent way of gathering reference material for drawing classes, not only for out-of-door sketching subjects, but for material of a general nature which can be cataloged and be always at hand whenever the demands of your classes call for reference material. The writer always carries a camera wherever he goes, because many times a sketch is snapped where there was no time at hand to draw, or a hurried sketch is made and the "lever pressed" to refer to in making a finished drawing. Such experience with a camera is bound to improve one's picture-making sense. You find your picture thru the view finder and move about until you have adjusted within this finder the best combination of lines and masses that will go to make a pleasing composition.

We have determined our subject and have selected the most interesting point of view, our center of interest is unmistakable in the dark mass the doorway presents, the masses are simple with the strong sunlight coming from the right and behind. The foreground is simple, broken here and there by masses of grass and groups of rocks, so characteristic of New England, and the perspective rendering of the subject is well within the ability of the high school student.

It has been found more successful to start by selecting the important parts of our picture and make simple, direct drawings of these interesting parts, than by attempting the larger subject. This procedure in a way reviews the various strokes considered in our first article and places into practice these strokes, allowing the student to judge the quality of tone and the manner and direction of the strokes to be rendered. These simple renderings lead to a quicker mastering of the technique of pencil drawing than by dealing with the complete sketch as an initial problem, and in no way does this approach to the subject detract from the interest and success of the final drawing, but tends to better results.

We will select as the most interesting feature of our subject, the doorway with its broken steps; the large rock in front of the doorway, with the weeds and grasses giving a contrast against the strong sunlit boarding; and the deep shadows of the doorway and steps, with the interesting shadows cast by doorway and shingles.

We block in the general proportion of the doorway and add the darkest dark to the shadowed entrance and under the boarding and steps, with a 2B pencil. The light side of the doorway is rendered in 4H value and the side that has the less direct light is drawn with a pencil of HB grade. While this contrast is more than actually exists in the picture, we must obtain a contrast of values for different planes. This is shown more strongly in the rendering of the foliage as it comes against the side of the house, the value being more intense in contrast with the value of the boarding. Each stroke follows the general plane of the part rendered as in the boarding, rocks and foliage (Sketch B).

Another important part of the picture is the window (Sketch A) partly opened and propped up by a stick. The darks in comparison with the light and surroundings of the window are made more intense to gain contrast. The darks are rendered with a 2B and HB pencil and the light values with a 4H pencil, the accenting, as under the shingles and boarding, is done with a sharpened point of a HB pencil.

The old pipe, cemented into a frame which is attached to the roof, serves as the chimney for the old house. This and the old weather-beaten shingles are worth rendering (Sketch D). The darks of the chimney and the shadow cast by the overhanging roof were first drawn, the shingles and boarding were drawn in 4H value with accents made with a HB pencil. The white paper is continually allowed to show thru, which adds a sparkle to the contrasting values.

The tree that casts a deep shadow over the small addition to the building offers the opportunity of foliage rendering. I have suggested the lower portion of the tree in simple massed strokes of HB and 4H value. The manner of rendering such strokes is controlled by the direction of the masses of light and dark leaf arrangements, each mass of light and dark must make a pleasing pattern in relation of one to the other (Sketch C).

THE COMPLETED SKETCH.

Under the window is an interesting pile of rocks or field stone with grass and foliage. As the value of the rocks is light, the grass must be drawn in contrast to this lighter value; a 4H and HB pencil was used for this sketch (Sketch E).

After rendering these five interesting parts and obtaining a class criticism of the drawings, we are ready to start the complete sketch.

A most successful plan, wherever possible, is to have the teacher render at this time, on a large sheet of paper 22″x28″ with large pencils of varying degrees (which can be purchased at any representative art dealers') the sketch selected, as it will present to the class a systematic method of approaching the complete subject.

After drawing the general leading lines of the sketch, by carefully noting the proportions and the problem in perspective that confronts us, we are ready

THE ORIGINAL PHOTOGRAPH.

A
B
C
D
E
JACOBS

to lay in our darkest values. In the beginning it is well to make your perspective drawing rather complete, separating such values of light and dark by outlining the mass forms, as example, the shadow cast by the door, and tree on the end of the building. All these preliminary lines should be drawn very lightly, as none should appear in the final sketch.

With the carefully, but lightly perspective outline completed, we place in the dark masses of the doorway, window and chimney with a few touches of the dark value in the tree, all of which gives you a value scale from light to dark (light the tone of the paper) from which you can judge all intervening tones.

In making a complete sketch, it is best to work from the center of interest out, that is after you have distributed your darks and set your value scale, return to the doorway, the center of interest, and work from there out, keeping in mind the front of the house is in light and the side of a slightly darker value. Work this way in a mass of direct strokes, drawing the value of the various sides of the buildings, and roofs, foreground and foliage. After the general massing in of values has been completed, return to the center of interest and with an HB pencil sharpened to a medium point accent your sketch, being sure to keep the accents of less importance as you draw away from your interest point. This is also true of the masses, the darker masses occur near the center of interest and gradually break into lighter mass and line as they go away. All lines and masses should exalt the center of interest, that is, they should lead the eye to the center of the picture.

In the completed picture, the eye is carried to the doorway, altho there are equal darks distributed thruout the drawing. Even the dark shadow cast by the tree does not hold the eye. The tree and the buildings on the left are not drawn in complete form but are suggested in mass form, both enhancing the center of interest and making the sketch more complete.

In every sketch attempted, one is obliged to omit considerable detail and objects that actually appear, and on the other hand to add where there is needed a tree, shrubs, fence or foreground, in order to complete and round out the drawing.

In the full-page drawing of Gloucester wharves, the values are kept as simple as possible, keeping the interest centered about the open doorway of the large warehouse. This drawing was made in about one hour's time with a large audience of boys asking a million questions. One must get used to audiences in sketching out of doors, for the many remarks made are not as complimentary as those made by the child admirer. As one old salt said as he gazed over my shoulder, "You must be hard up for something to draw, to draw that old place." I learnt afterward that this vessel and the company that controlled it had just come in with a big fish haul and was a big competitor of the vessel that this salt sailed on—so I felt better.

The Administrator and the Part-Time School

H. V. Church, Principal J. Sterling Morton High School, Cicero, Ill.

THIS is the day of the rise of the part-time school in the United States. Such schools are not absolutely new today, for both abroad and in this country there have been part-time schools which date back more than fifteen years, but it is only within the last ten years that there has been much agitation for them, and only within the last five that there has been a marked interest in their establishment. Ten years ago Wisconsin set up her split control part-time schools; today almost one-half of the commonwealths of the United States have enacted laws which require part-time schools. Thruout the decade just past more than one country besides the United States has decided that it was fully time that it set its educational house in order and do something for that majority of adolescents between 14 and 16 years of age who are not in school. Germany has had such schools, notably in Munich; France now has adequate plans, England has met the demand in her Fisher bill, the United States has its Smith-Hughes law and as a consequence of it there are concurrent laws in 25 states today. Therefore it behooves every schoolman to acquaint himself with the movement, to devise plans for the administration of such a school, and do his utmost to find funds to float it. The part-time school is upon us, and we must meet it in a sincere and wholesouled manner.

At the outset one should not confuse part-time schools with evening schools. There is much loose writing and thinking on this point today. It is regrettable that readers' guides and magazine indexes scramble these two widely differing kinds of schools. An evening school is a continuation school in but a small sense of the word. The continuation feature is seldom present, for the short unit courses given in the evening schools are for many different classes of adults who are not pursuing an educational course, recently broken off, but are for those who suddenly find themselves totally unprepared or only partially prepared, for some calling recently entered into, and who, desiring to fit themselves for their new occupation, avail themselves of the evening instruction and pursue these short unit courses in the evening while they follow their regular stated employment in the daytime. A part-time school, on the other hand, is one for those who are employed, who have not completed an elementary or secondary course, and who spend part of the time, regularly devoted to day employment, in a school in which they continue an educational course but recently broken off.

European and American Movements.

Before the world war began there were part-time schools in Germany and in the United States. At that time progressive educators in these two countries were interesting themselves in part-time schools, but the agitation was following different channels in the two countries. In Germany the leaders were bent on developing citizens with the end of extending the power of that country, or rather in making the youth of their country worshippers and willing disciples of the emperor. In the United States the educators were striving to educate for citizenship with no other end than that the citizen should rise to a higher level. Then came the world war, and it had a tremendous effect upon this type of school. The movement for continuation schools advanced rapidly, for the well-known efficiency of the rank of the German Army caused French, English and American educators to review their educational shortcomings and immediately to decide where amendment should begin. The result in England is well known, for thru the Fisher bill part-time schools have full recognition there and are on a better basis in some respects than in the States. France at once set her educational machine in motion, and part-time schools will soon be found thruout France. Quickened by this same stimulus, the Smith-Hughes law was passed, and as a result of this federal law and of the feeling that we must keep abreast of the world's advance, our part-time schools found their foundation in the laws of many states in this country. Hence we can say that the world war had one of its most pronounced results in this department of public education.

Altho quickened by the world war, legislation for part-time schools has a deeper meaning than efficiency and military training for the youth of any nation. Those who were prominent in bringing about the enactment of part-time school laws saw farther than simply competing with Germany or outstripping her in the preparation of their youth. A wider meaning lies underneath all this legislation. Those for whom it was enacted are today recognized as the neglected asset of a nation. The youth of a country are not all in the schools. Over one-half of those between 14 and 16 years of age are not in school. They are not only not in school but they are, for the most part, not in employment that leads anywhere. The majority of these adolescents are the drifters, those who are "hired and fired." Still further, it is recognized by educators that these neglected youths have now at last come into rights hitherto long denied them.

New Obligations for Schoolmen.

It can well be said that part-time school laws are bills of rights for these children. But this legislation means not only more rights for the children, but it means additional obligations to schoolmen. No right-thinking schoolman can sit back and say, "Part-time school laws are wonderful laws, just what we have been looking for this long time. Now that the laws require the children to remain longer in school, the problem of the education of the youth of the country is solved." An extension of school age for a year or two will not accomplish the end sought. A new heaven and a new earth are not in sight because part-time school laws are enacted. Along with the added opportunity given by the extension of schooling must come a better appreciation of the problem of education. Changes in methods must come with the part-time school. Not only information that will aid in later life, but principles and ideas must be given that will supply needs, will equip to meet new situations, and will help to solve problem after problem as they come in later life.

It is to be hoped that the old struggle between unit and dual control of school systems will not have to be fought over again. Ten years ago that struggle was on, and the National Society for the Promotion of Industrial Education was the arena in which the big fight took place. In some states, notably in Wisconsin with her cleft control, it looked as if the modified dual system was victor, but in most of the states unit control won the day and the schools of each community are destined to move under the leadership of one administrator. But with the passing of the Smith-Hughes bill in 1917, the National Society, referred to above, won its fight in Congress, and now gradually, as the states enact legislation to conform with the Smith-Hughes law, the old question comes back in a slightly different form. For altho there is one administrator at the head of each system now, if he adjusts his school so as to receive Smith-Hughes reimbursements, he will soon find that he must almost run two schools in order to get the maximum returns from Smith-Hughes money.

Dual Control vs. Democracy.

In the part-time schools of some of the great cities today the dual system is found with almost separate control, with separate buildings, separate corps of instructors and separate curriculum. This is exactly what should not take place, difficult as it is to avoid in a large city system. The part-time pupils should not be separated from full-time pupils; they are not separated in the grammar schools before they are 14 years of age and they should not be separated after they are 14 years of age. If our educational system is a broad educational stairway from the kindergarten thru the university, there should be no back stairs for part-time pupils. There should be no mechanical device of separate buildings, separate faculty, separate curriculum to set these adolescents apart in a separate caste. Let them all, both full-time and part-time pupils, grow up in the same school in the same community; to be good citizens of the same state.

Schoolmen should not forget in establishing a part-time school that this is a democracy in which we live and that schools should be run on broad, democratic lines. As soon as the schoolman immerses himself in the details and problems of a part-time school—and the

details are many and the problems complex—he must keep ever before him the principle that schools must be democratic, that the whole plan must be cosmopolitan, for at once he finds himself face to face with the fact that the part-time school is going to be an expensive proposition, and altho there is reimbursement from the State thru Federal government, he will find himself molding his school along undemocratic lines if he follows closely the regulations laid down by the state boards which handle the Federal money. In the first place the schoolman will be pressed for room for part-time classes. He should not be led astray by offers of corporations to set apart rooms for their employees somewhere in their plant if he will run a branch part-time school there. Neither should he feel that he must set up his part-time school in a separate building, for thus he has set apart his part-time pupils as those of a different caste, and has done a reprehensible thing in the eyes of all democratic, broad-minded schoolmen.

The details of the manipulation of the Smith-Hughes money are something as follows: If you use part of the time of a regular teacher to teach continuation classes, only that part of his time which is devoted to the continuation classes can be reimbursed; all the time of such a teacher devoted to study hall, home rooms, and conferences cannot be reimbursed. Whereas if one assigns the full time of the teacher to the continuation work all the time of that teacher comes in for reimbursement whether he devotes all of his time to classroom work or not. Now this interpretation on the part of vocational boards in commonwealths one can see at once works for an undemocratic situation, for it forces schoolmen who are pressed for funds to use teachers their full time in the continuation work in order to get complete reimbursement for that teacher's salary. Thus he has set apart a teacher in separate classes, with a separate piece of work, with a separate group of pupils. It would be more democratic to mingle pupils of the full-time and part-time schools and also have the teachers teach both full-time and part-time classes wherever possible.

Surveys Not Particularly Valuable.

The first bit of work that occurs to a schoolman in connection with the setting up of a part-time school is that it would be wise to make a survey of his district. But a survey is quite likely to be a waste of money, for now-a-days industrial populations are almost liquid and flow about without reason. Unless the community is an old and settled one, a survey would be worth little for part-time school purposes, for by the time it was completed many would have moved in and many would have moved out. It would be far wiser to call on the employers of those persons whose ages lie between 14 and 16 years of age and find out what these employers would like to have taught in a part-time school. My experience after such conferences was that the employers felt that they could do a much better piece of work instructing the part-time pupils in the vocational side of the work and that they hoped that the part-time school would emphasize chiefly English and mathematics. If I had set up a part-time school on the basis of a survey of my district and without knowing what the employers desired, the continuation work in my part-time school would have been of a very much different nature. I am firmly convinced that it is a part of wisdom to work with the employers from first to last, for a part-time school administrator will find that he will have most powerful assistance and cordial cooperation from the employers of the part-time pupils.

The next step is to get the names and addresses of the pupils who ought to attend your part-time school. If the officers who have issued the work certificates to those who leave the schools and go into employment as soon as they are 14 years of age have done a good piece of work, from their records one can obtain the names and addresses of those who ought to be in this school. A brief letter to these pupils, with the proper excerpt from the law, will bring them at the proper time to the school. One should also secure the cooperation of these certificating officers, for he should be promptly notified each time a new work certificate is issued. As his part-time school gets under way, one will constantly have the feeling that he has not obtained the names of all who ought to be in his school, and it is quite true his list is not complete, but he will have plenty of material from the work certificate sources to start a school. Later, one of his teachers can devote part of his time as an attendance officer and will in a very short time find the stragglers that ought to be swept into the school.

English and Physical Training.

In laying out the course of study for part-time pupils the administrator should keep in mind that the one great object of the school is to make better citizens. Therefore, it seems to me that not only English and mathematics but also work in social science should be required. The third required item in the curriculum should be physical training. It is perfectly evident on assembling the full-time pupils and part-time pupils that the latter appear not only underfed, and undeveloped, but also, I regret to say, unwashed. The required work in physical training will mend all three of these shortcomings. We should constantly keep in mind the Fisher bill of England which requires not only physical training but vacation outings for the part-time pupils. England has written into her part-time law something that we should copy. Besides these four items which should be required, there should be elective subjects. For the girls, sewing, cooking, shorthand, typewriting, salesmanship, and millinery are good optional offerings. For the boys, all kinds of manual training and trade work should be given, for the part-time school should be a trade-preparatory school as well.

About the time one has decided on the curriculum for his part-time school, he feels that he must have teachers, and here is the crux of the whole proposition. *The director makes a fatal error when he decides that the part-time pupil can be trained by a mediocre teacher.*

Let him reflect that these pupils left school largely because the school was not giving them what they wanted. Perhaps half of those who are 14 and 15 years of age, and who are not in school, left because they were keen enough to see that they were not getting in school what they needed. For this type the best teacher that money can buy is necessary. There is another class of pupil that is more marked and more frequent in a part-time school, and that is the pupil who has an undiscovered aptitude. Now, I ask you, can such an one be trained to his limit by a mediocre teacher? Absolutely not. It will take the keenest, brightest, and most thoughtful teacher to draw out this second class of pupil.

A third class of pupil common in a part-time school is the one who believes that a schooling is of no value in his chosen calling and that it can assist him in no way to do better work. It takes a skillful teacher to show this type of pupil that he will grow more rapidly in his job and will advance faster, if he knows the history of this calling, if he knows the lives of those that made a success in it, if he knows the shortcomings of those that made a failure in it, if he knows the principles of the sciences that underlie it. No mediocre teacher can win such a boy to study to make himself a "workman approved." The teacher of a part-time school is the one that is so good that he should, in justice to the service rendered, be paid somewhat better than the average high-school teacher.

Program Making.

When it gets down to the little task of making out a program for the part-time pupils, employers must be consulted as to the time they prefer to release the pupils for the school work. Every effort should be made to conform to the wishes of the employers, for it is pretty inconvenient for an employer to be forced to release some of its employees to go to school at a time when he needs them most. The administrator of a part-time school should do his utmost to have the pupils come to the part-time school during the slack hours of the week.

In making up a part-time program a good plan is to set up four groups of pupils at one time; for example, let groups A, B, C and D report Monday mornings and Thursday mornings from 8 to 12 o'clock. There will be in these four groups from sixty to seventy pupils with a few over fifteen in each group. For physical training the boys in these four groups can be combined for one and the girls for another. This will put from thirty to 35 boys and from thirty to 35 girls in each physical training class. The groups can again separate for the optional subjects of typewriting, cooking, and sewing for girls, and mechanical drawing, shopwork and automobile mechanics for boys. Thus the program for these four groups would be: at 8 o'clock, group A, in English, B in social science, C in mathematics, D in natural science. At 8:40, 9:20 and 10 each group can go to one or other of the three remaining subjects. That would leave the remaining time to be split between physical training, in which the boys and girls are separated, and the optional subjects mentioned above.

It has been my experience that mingling the part-time pupils with the full-time pupils has made a great change in the personal appearance of the latter pupils. At first they are easily distinguished as the pupils move in the halls. In a short time they modify their dress, their care for their personal appearance and their deportment, so that they cannot be told from the others. It is a part of our plan to mingle these part-time pupils in the physical training classes and in the public speaking work with the full-time pupils. They join with the full-time pupils in the assembly every day and there enter into the mob life of the school in school songs, school cheers, and the general exercises of the daily assemblage of the school.

Grading Students.

When the pupils in response to the letters of notification come to the school, they must be graded. The basis of grading is important. We made the error of classifying the pupils according to the work they had completed in the school they had last attended. This is not a secure basis for classification. One cannot obtain homogeneous classes in this way. To put pupils who left the sixth grade three months ago with those who left the sixth grade a year or two years ago will not prove satisfactory. It will not be satisfactory to place twenty of those who have just left the seventh grade together in one class, even if they are to pursue an academic subject. The reason is that they have not all the same ability to learn. Take a group of twenty, some of whom left the eighth grade two months ago, some who left it fourteen months ago, and others who left it twenty-six months ago, and one has a very uneven group, practically an ungraded school. The best solution is to give these pupils an intelligence test and arrange them in classes in accordance with the results of the test. If one stops to reflect it is perfectly patent that an eighth grader who has been out of school for two years and who has a high ability to learn cannot travel with another eighth grader who has been out of school two years, but who has a low ability to learn. These two are more than two school years apart on their return to school and they will keep getting farther apart. In grading part-time pupils the results of intelligence tests furnish the best criterion for classification, the previous work in school the next.

Attendance and how to secure it, at first blush, looks like a hard problem to a part-time school administrator. It is one of the easiest connected with a part-time school. Most laws read "eight hours a week." If one will keep his eye on that slogan, the attendance problem almost disappears. Does the pupil play truant after attending part of a day's session? Hale him in and tell him he must miss an additional half-day of work this week to make up the time lost, for the law requires "eight hours a week." If he works for his employer in the morning, but is ill in the afternoon,

and therefore misses his part-time school, he may believe he has scored, but the next time he comes, require him to make up all time lost for his illness, for the law requires "eight hours a week." The extra time required of the part-time pupil promptly brings a reprimand from his employer, and the part-time pupil wants to hold his job and to stand well in the eyes of his employer. "Eight hours a week" brings about a better percentage of attendance in part-time school than can be attained in a full-time school.

Discipline and Other Problems.

Someone may rise to ask whether discipline is not more difficult in a part-time school than in a full-time school. Here again the cooperation of the employer is a specific in effecting a cure. If a pupil is called in and told that he is wasting his time and a second reprimand will bring his case to the attention of his employer, nothing more need be done. Some employers of the part-time pupils cooperate to the extent that they threaten the pupil with suspension from work in the factory until lost school time is made up. Our greatest difficulty with the part-time pupils is to get them to take a bath. They hate to bathe after a physical training period, and many have balked completely, on the days they have to go to the pool, on taking a shower bath always required before one is allowed to enter the pool. It may be this trouble will wear away in the spring, for perhaps they are sewed up for the winter. On one other item we have had some disobedience, and this is in regard to prepared school work. We require the preparation of lessons outside of school. We have had some trouble with pupils, whose interest in the work we have been unable to arouse, in having their work well prepared. A threat to report them to their employers has sometimes effected the change desired.

We are finding that it is wise to segregate the boys and girls in the continuation classes in one other subject besides sewing, cooking, shop, and physical training. In the science classes the girls have more concern in the science that relates to sewing, cooking, and other interests peculiarly feminine than in the weather, geology, physics, etc.; while the boys are enthusiastic about science that is industrial rather than domestic. But this conclusion is only part and parcel of a long known principle of pedagogy, that of interest.

The part-time school problems are new, complex, almost bewildering. The schoolman whose interests have been almost entirely cultural will have to shake himself, arise, and admit that a new vista is before him.

QUEEN ANNE FURNITURE

Leslie G. Martin, West Henrietta, N. Y.

THE Queen Anne period in English furniture includes the reigns of William and Mary, who occupied the throne from 1689 to 1702; of Queen Anne, who reigned from 1702 to 1714, and of King George I, who ascended the throne in 1714 and died in 1727. The furniture of the Queen Anne style continued to be popular after the crowning of George II and until the middle of his reign, when the influence of Thomas Chippendale began to be felt.

The houses of the Queen Anne period were interesting and artistic. The exteriors were distinctive and the interiors were noted for dignified rooms and halls. There were wide staircases and "barley-sugar" balusters and carved newel pendants. The doorways were often of the beautiful hooded type and many of the circular hoods were supported with brackets carved with lions' heads. The door jambs were ornamented with delicate interlaced carving. This period saw a revival of classical architecture in England and was noted for the construction of great public buildings, like the famous St. Paul's Cathedral, designed by Sir Christopher Wren.

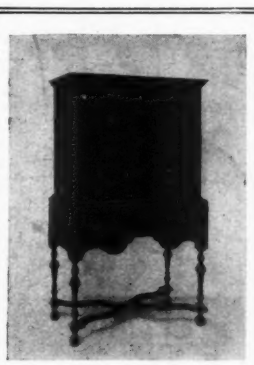
The furniture of the Queen Anne period was more comfortable than that of the preceding period. The chair backs were shaped and the corners of the seat frames were rounded. Where this rounding occurred, a smooth cabriole leg or one carved with an escalloped shell with pendant husks below, was generally used. Later in the period cabriole legs were made to terminate in a vigorous ball-in-claw foot. The earlier Queen Anne chairs had a raised cresting on the center splat of the back. On later chairs, the splats were designed with a depression at the top. About 1710, chairs were designed with cabriole legs having scrolled knees, and the backs had fiddle-back splats. A carved shell decoration was used on the corners of the seat-frames and the stretchers were omitted. Some of the less expensive chairs, however, retained stretchers which were turned or shaped. The underside of the seat-frames also was shaped. The seats were generally upholstered but occasionally rush seating was used. The chair leg sometimes had a small astragal ring just above the claw and ball foot.

Marquetry was used to inlay the back splats of some of the chairs and the work, which showed Dutch influence, was quite elaborate. It was during the years from 1700-1705 that English marquetry reached its height of popularity. Altho marquetry and inlays of various woods were used, the color schemes were subdued. The marquetry was arranged in spandrel corners, ovals and circular panels and wide banding was employed. At first designs of natural flower and leaf forms were used, but these developed later into designs of scrolling acanthus leaves and conventional flowers. The later foliated work resembled the Italian. Marquetry furniture declined during the reign of George I.

Many of the earlier chairs in the Queen Anne style were veneered, but later many pieces of furniture were

made in plain walnut. This wood seems to have been the popular cabinet wood of the period.

During the period, writing chairs were made to go with small cabriole writing desks. These chairs were constructed with solid wood backs and curved arms and the upholstered seats were mounted in loose frames. Some of the chairs had pierced splats in the backs and resemble some of the early Chippendale models. About 1710 wing chairs were made in more comfortable types. They were ornamented with carving showing the influence of current French and Italian furniture design. They had seats of padded horse-hair, but no springs were used. The construction of the legs and stretchers was similar to that of the other models.



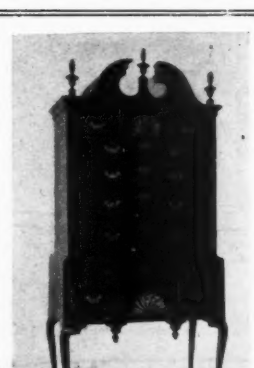
2. SMALL TABLE, GEORGE I - ABOUT 1725. THE LEGS ARE OF THE CABRIOLE TYPE. THE TOP HAS A MOULDED EDGE. THE UNDER FRAMING IS SHAPED. SOME OF THESE SMALL TABLES WERE MADE SO THEY COULD BE EXTENDED.

1. CHEST OF DRAWERS. GEORGE I. 1710-1720. THE STAND HAS TURNED LEGS WITH INVERTED CUP SHAPE AT TOP. THE DRAWER FRONTS ARE VENEERED. THE STRETCHER IS SHAPED LIKE AN "X"

3. QUEEN ANNE ARM CHAIR, 1702 THE BACK SPLAT IS CARVED AND PIERCED. THE LEGS ARE OF THE CABRIOLE TYPE. THEY ARE CARVED WITH AN ACANTHUS LEAF DECORATION.

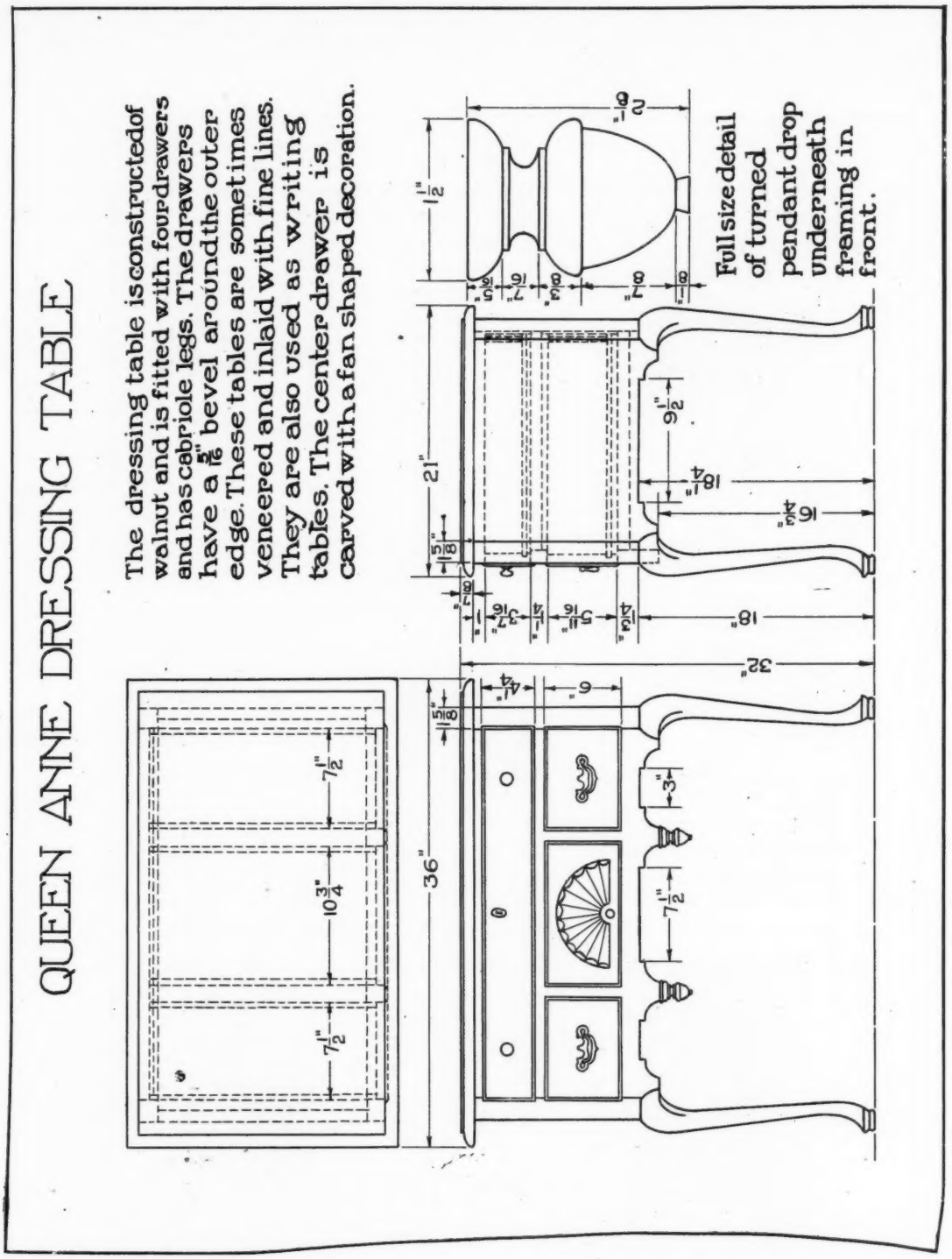
4. QUEEN ANNE, TALL BOY. CONSTRUCTED OF WALNUT AND FITTED WITH ELEVEN DRAWERS. THE DRAWER FRONTS ARE VENEERED AND INLAID.

5. GEORGE I, TALL-BOY. 1725. HAS CABRIOLE LEGS AND SHAPED UNDER FRAMING. THE DRAWER FRONTS ARE ORNAMENTED WITH A SIMPLE MOULDING AND CARVING.



QUEEN ANNE PERIOD
WILLIAM & MARY 1689-1702
ANNE, 1702-1714.
GEORGE I, 1714-1727

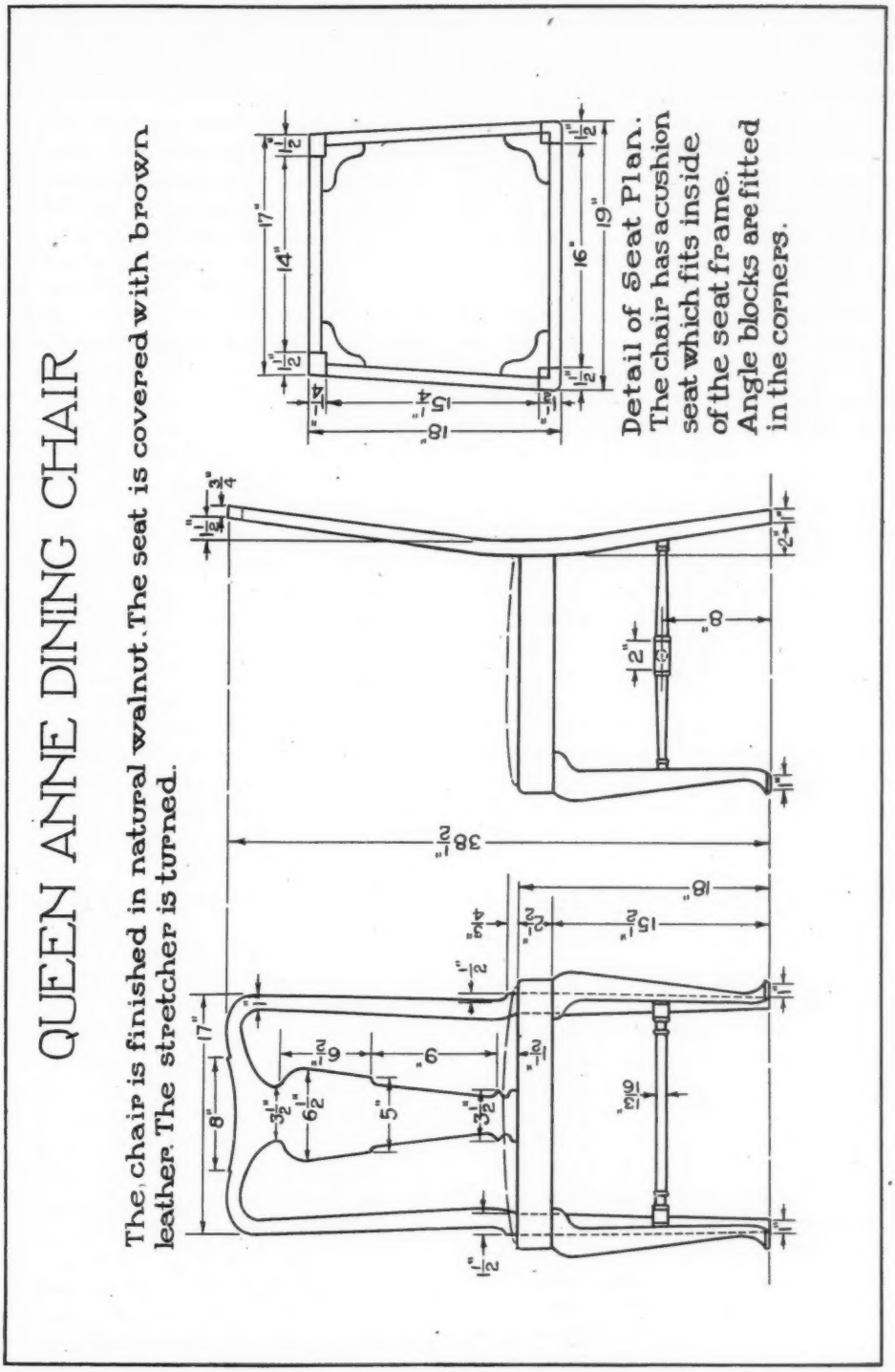
QUEEN ANNE FURNITURE


QUEEN ANNE DRESSING TABLE
The dressing table is constructed of walnut and is fitted with four drawers and has cabriole legs. The drawers have a 5/16" bevel around the outer edge. These tables are sometimes veneered and inlaid with fine lines. They are also used as writing tables. The center drawer is carved with a fan shaped decoration.
Full size detail of turned pendant drop underneath framing in front.
32"
36"
21"
18"
7 1/2"
10 3/4"
7 1/2"
7 1/2"
3"
7 1/2"
9 1/2"
18 1/4"
16 3/4"
6"

Settees changed considerable in design and construction after 1710. They were made much smaller and were called "love-seats." The arms were designed with outward curves and the backs were carved with rounded corners. The legs were of the cabriole type with club feet. On the seat covers petit-pointed needlework and tassled fringes were used. Settees of the double chair-back type had broad back splats ornamented with carved leaf forms. Later the settees were made with open arms instead of solid upholstered sides.

In the early part of Queen Anne's reign, stools were designed to match chairs and settees and were used principally for ornamental purposes.

Walnut secretaries were designed with classical cornices and half round friezes. The bracket foot was used on many cabinets and chests. Handles and draw


QUEEN ANNE DINING CHAIR
The chair is finished in natural walnut. The seat is covered with brown leather. The stretcher is turned.
Detail of Seat Plan. The chair has a cushion seat which fits inside of the seat frame. Angle blocks are fitted in the corners.

pulls were shaped and crudely engraved and the later types were pierced.

Bureau cabinets, usually of graceful proportions, were constructed with many drawers and pigeon holes. Design was frequently marked by the use of architectural details.

Single or double chests were the next development in new furniture. The chests were modified in various ways; some were made with several drawers on a stand with twisted or cabriole legs. On many types of chests veneering and banding were used.

During the Queen Anne period dressing tables with projecting fronts on the drawers came into use. The edges of the drawer fronts were molded and banded with various woods and drop handles were generally used. On the tables were placed small toilet glasses, which had

flat shaped heading and which later was developed into a bolder rectangular frame.

Lacquered furniture was also popular during the middle of the Queen Anne period. Lacquer was used on chests and chairs, cabinets and frames, and was either flat or molded in low relief. Delicate caning was used in some of the lacquered chair backs.

The years from 1714-1725, which was practically the span of time embraced in the reign of George I, are generally termed the "Decorated Queen Anne Period." A characteristic of furniture of this period was the use of eagles and other ornaments of a rather vigorous kind. Eagles' heads were carved on the arms of chairs and settees, on the knees of cabriole legs, and some of the more elaborate chairs, the ornament was picked out in gold. Another development was the carved leaf on the knee of the cabriole legs, carried around in a small pattern to form the ear piece. The chairs which gradually developed from the hoop-back to the square-back, were further carved with a gadroon molding on the seat framing. The cabriole legs were constructed with a long sweep, almost straight on the inside, and the back splats of the chairs were decorated with carved palmette patterns.

After 1720, mahogany became popular in furniture construction.

Tables of a variety of shapes were used. The gate-leg table was not common, but flap tables with Spanish scrolled feet were built. Card tables having turned legs terminating in club feet were constructed with circular and oval tops. Most of the tables were of rectangular shape and some were arranged so that they could be extended. A detail of some tables was a depression in the corners for holding candle sticks.

Between the years 1720-1740, legs of tables, stools, settees, and chairs were sometimes decorated with the heads and feet of lions. The detail which is thought to be of German origin, was largely carved in low relief. About 1730, the lion heads were carved with rings in the mouths and the feet were tufted.

During this time the construction of the furniture was very similar to the earlier Queen Anne models. Mahogany was used more than walnut and velvet replaced other materials for upholstering. Slightly later satyr-masks were carved on the furniture and claw-and-ball feet were used. The satyr heads had many variations; some were winged, others had horns, and still others followed an Italian type.

About 1735, during the reign of George II, a new ornament was introduced. This was the cabochon and leaf decoration of French origin. It was an artistic ornament and continued in popular favor until about 1750. During this time the lions' paw feet were carved on many pieces in a feeble manner. Castors of hard leather discs between brass plates were introduced.

Furniture designed between the years 1720-1750 shows many architectural influences due to the fact that many architects were actively engaged in designing chairs, tables and other movable pieces to harmonize with the general decorative schemes which they provided for homes. While many of the architectural features were beautiful, some of the elements were misapplied.

The Electrical Department in a Comprehensive High School

C. E. Crofoot, Utica Free Academy, Utica, N. Y.

The Day Classes

THERE are two distinct types of courses offered in the electrical department of our day school: First, a two-year vocational course; second, a four-year technical high school course (not college preparatory); third, a four-year technical high school course which is college preparatory.

The first, or vocational course, is organized under the Smith-Hughes plan, that is, for boys who are at least 14 years old or past the eighth grade. In our case all of the boys are grammar school graduates and ready for high school, but feel that they cannot stay in school long enough to complete a regular high school or technical course, and yet want to take up electricity as a life work. These boys attend three hours a day, or fifteen hours a week. The rest of the time is spent in applied mathematics, mechanical drawing, civics, and industrial history, etc. Their work covers a practical course in bell wiring, house wiring, wiring for light and power in factory and office buildings, principles and construction of D. C. generators and motors and the fundamental principles of A. C. circuits and A. C. machines. They are also given trouble shooting and general repair of electrical machines with two hours per week of theory and lecture work.

The second, or technical course, is designed especially for those who can and want to come for the four years but, in all probability, will not go on to college. These boys take one and one-half hours per day, or seven and one-half hours per week, for the four years. The balance of the time is spent in taking higher mathematics, science and other high school subjects which the vocational boys do not have time to take. The first and second years' work in the technical course is very much the same as that of the vocational group, but in their last two years they go more into the theory, testing, design, general maintenance and construction as applied to manufacturing and power plant installations. This is made possible by the fact that they have the advantage of the additional training in mathematics and science.

The third course is quite similar to the second, with the exception that those who are taking it are preparing for the engineering courses in college and are

therefore spending a little less time in electricity and taking up some other subjects which they must have for college entrance.

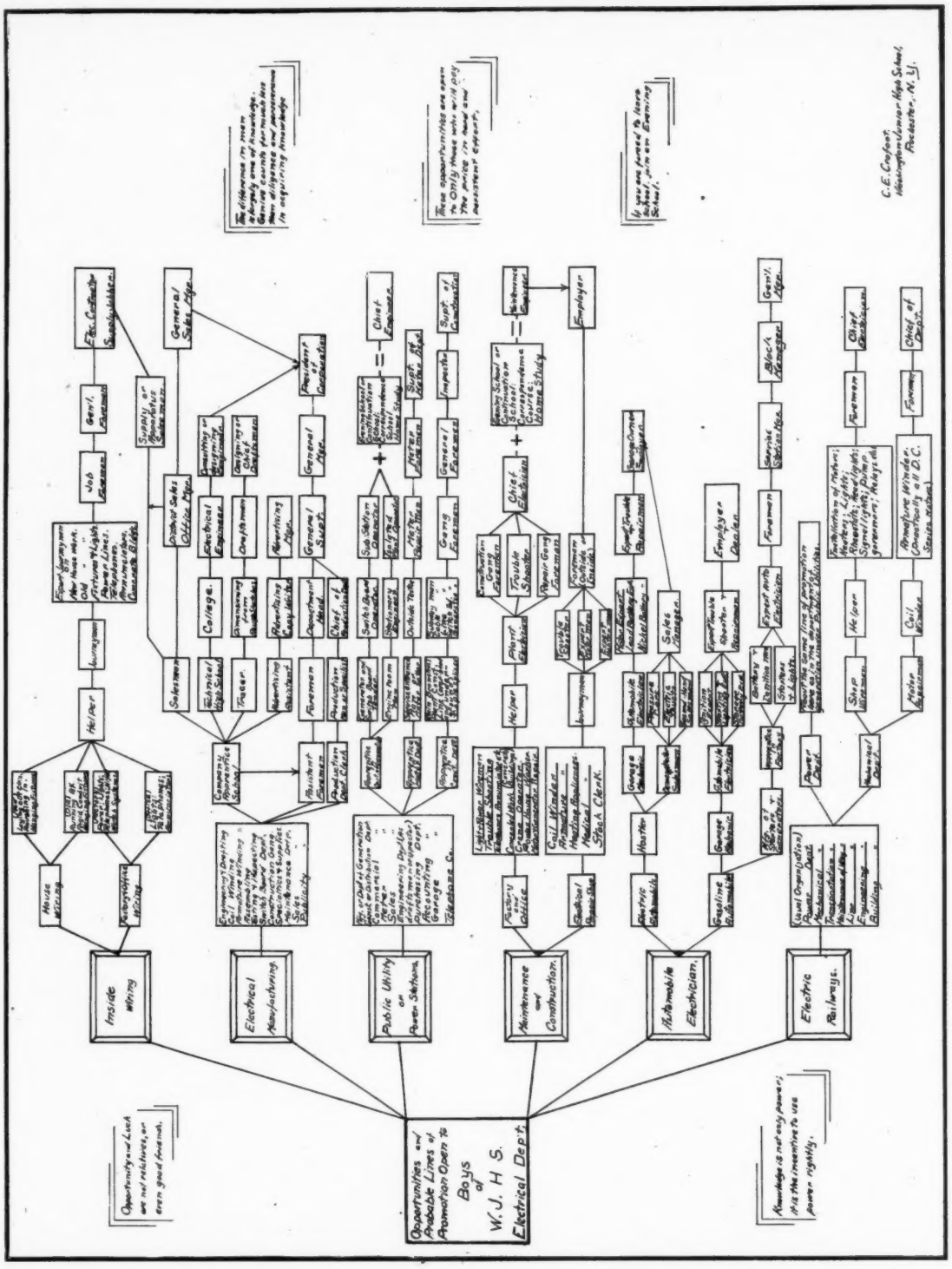
In brief, the general aim of all three courses is to give the boys a clear-cut idea of the fundamental principles of electricity and magnetism that are applied in the construction and uses of electrical machinery and appliances, as well as the best or principal methods of wiring buildings for the efficient distribution of light and power; to encourage or create a desire for home or individual study so that a boy will continue to develop in knowledge and efficiency after he is out of school. This may be still more briefly stated by saying that it is to get the boy in the habit of "doing his own thinking." This, without doubt, is a hard part of teaching, but it is the thing which will lift a boy, and finally the man, above the average much quicker than genius or special ability, which are really rare.

The writer, at first, used the stencil form of lesson sheet with complete drawings of each circuit or problem and no textbook. In place of the textbook, topics were assigned with each practical problem, for reading, in a number of different texts, handbooks and magazines, with a series of questions, after each problem, to test the result of study and practical work. After a thoro trial and careful observation it was found that this method failed in at least two essential points of our aim. It did not make him do his own thinking and also, in most cases, tended to make him study in a fickle and hit-or-miss sort of way. He is continually leafing over the pages, reading a few lines here and there, looking at pictures, etc., with the result that much of the time he does not half read the article called for or is reading something which is way in advance of what he should. As a result he is not willing to thoroly study the fundamentals which are so essential to a clear understanding of the big problems later. Do not infer from the above that the writer is not in favor of using handbooks, other textbooks, or pertinent articles in trade journals as references, for in fact it is just the opposite; in our department you will find a very complete list of them in constant use. But they are used in addition to a regular textbook to illustrate one of the most essential points in home study, namely, that of reading several authors to get a clearer understanding of a theory or principle and to show that a textbook should precede a handbook. The handbooks serve especially well in supplying the standard practice for applying the theory which is given in the text.

The best results were obtained by merely stating the problem in as near the way it will be stated to the student or workman after he is out on the job. To illustrate: When a wireman goes to install a bell he is not presented with a complete sketch of the whole installation. Much to the contrary, he is shown by the lady of the house just where she wants the button, bell and battery and informed that he must get it in with as little muss and disturbance as possible. He then has to study the house as to construction and make his own layout, or, in other words, "do his own thinking," right there on the job. Why not teach him that way in school? It is better to present him with a set of typical layouts after, rather than before, he has completed the problems, for he will then look upon them as data which he has helped to gather and will appreciate their true worth. Get a good text and show him how to study logically and to build his knowledge of electricity on a good foundation instead of the hit-or-miss fashion that many do, with the result that they later have to start over again. One cannot put too much emphasis on the fact that while a half knowledge of a subject may be good, it is usually the other half that you most need. Most boys want to get right at motors and generators, and if one is not careful they will spend much of their time in reading such articles which are way ahead of where they should. Most people will agree that it is not practical to shingle a house before we dig the cellar.

In carrying out such a course a great deal depends on the equipment which should be chosen with a view of its being as practical as possible and of the type generally used in actual construction work in the locality where the school is situated. For example, it seems to the writer that it is quite impractical to spend much time on knob and tube work in cities where that type of wiring is not allowed at all when, with careful planning, conduit work can be carried out, with but little extra expense and the student is becoming familiar with exactly the same things that he will get when out on the job. It is, of course, true that the knob and tube work will illustrate the typical circuits, but a boy will never get the manipulative skill and speed that he needs for handling pipe, picking out circuits and making connections in small boxes. If he goes out as a helper in such a place he is at a big disadvantage when put on conduit work. The same is true with bell wiring, for the boy who has always wired on a smooth board in school is somewhat lost when he is forced to fish wire up thru the wall of an old house or rough in a new one. But if he has been doing his work in school under this condition with studding, floor joists, doors and even windows set according to standard spacing, it will not be hard for him to apply it to the job. To sum up, the equipment should be carefully chosen, with practicability and maximum instructive value the determining factors rather than the needless duplication of equipment which is so often found in vocational and manual training departments. There is little use of having ten pieces of apparatus alike when not more than one or two will ever need to be in use at a time.

Next to the amount of equipment comes the way in which it is placed or laid out. Where possible it is best to use at least three rooms for the type of work described. One should be used entirely for the wiring or vocational class, with the center room serving as a tool room and shop, that is for lathe, drill press, grinder, winding machines and such other apparatus as is needed


Opportunities and Probable Lines of Promotion Open to Boys of W. J. H. S. Electrical Dept.
Inside wiring
Electrical Manufacturing
Public Utility or Power Stations
Maintenance and Construction
Automobile Electrician
Electric Railways
C. E. Crofoot, Washington Junior High School, Rochester, N. Y.

for the construction and repair of motors, generators and other electrical appliances. The third room should be fitted up for an advanced testing laboratory for both groups. This arrangement makes possible the handling of two groups at once without interference and gives plenty of room for good work with each group. By using the one tool room we cut down on the amount of small tools needed. Where all the work is carried on in one room it is hard to keep the beginning class where they belong and at work, for they are always more interested in what the advanced class is doing than they are in their own work. Where possible, another small room, equipped with seats, blackboard, dark curtains and combination lantern, can be used to very good ad-

vantage, as both opaque and transparent slides can be used with splendid results, especially in evening school work.

A large part of the boys who will enter such a department will do so with no particular reason for their choice, except that "they thought they would like it." "A friend told them it was a good line." "It looks interesting," "It pays big money," or "They wanted to learn about motors." Only a very few will have any real reason for coming. In answer to this the writer has always found it a good plan to spend the first hour or two in drawing the class of beginners out on a careful analysis of the whole trade, showing them what the various lines are and where they will lead to; also what their probable line of promotion will be and what is required of the worker in the way of physical strength, education, environment, etc. After such an analysis many will decide that they are in the wrong place, and they are usually right, while, on the other hand, those who stick will be more keenly interested and will be working with a definite view of what they want. For use in connection with this vocational guidance the writer has worked up a chart, called an "Opportunity Chart," which shows the various lines or branches of the industry and the probable lines of promotion, it has proved of great value to both school and home in getting the boy started on a line for which he is fitted. It is surprising how many boys will spot the "blind alley" job themselves if given a sort of acid test which they can apply when choosing a vocation. It also helps them to see that it is not always the employer's fault when they are not promoted; perhaps the job isn't worth any more.

In summing up the things a boy must be taught if we would have him attain the higher stations in life, perhaps the foundation is to get him in the habit of "doing his own thinking" in a clear and logical way and to cultivate "self-reliance," "self-control" and "courtesy," for to be a success as an electrical worker he must think fast and with precision and have a fundamental knowledge of the subject which will enable him to trust his own judgment. To throw a switch at the wrong time, even under the strain of excitement or trouble may cost untold amounts of money and even human life. Electricity moves quickly, with no chance for a second thought. His work is such that it may take him into all sorts of industry, offices and homes, so he must maintain complete self-control and be courteous at all times if he would succeed. He should realize that brains and resourcefulness will always bring a much higher price in the industrial market than crude workmanship or raw material.

Evening Classes.

Our evening classes are made up of an entirely different type of students from that found in our day classes. The types of courses, however, differ but little from the general courses given in the day school, especially for the beginning group. But with the advanced group the work becomes more special in character, covering, in general, the same work, but most of the students doing only those parts which are of special interest to them. This is governed by the type of work they are doing in the daytime. Our whole evening class is at present made up of tradesmen.

There seems to be a general complaint about evening school classes falling down or being closed up for lack of students and regular attendance. This, in the opinion of the writer, largely because the students do not get what they want, instead of its being a characteristic trait of such people, as many claim. There are more finishers among them than they are generally given credit for. It is more often due to some of the following causes: "Lack of proper equipment," "wrong type of instruction," "overcrowding of classes at the start," and perhaps the most common of all, "attempting to dictate to the individual just what he needs." It is useless to advertise classes in the various branches of electricity or other industrial subjects unless there is a sufficient amount of equipment to carry them on efficiently, for the average evening-school student comes for the very purpose of getting a chance at equipment or apparatus which he does not have the opportunity of working with during the day, and if he does not get it, he will soon become disheartened and drop out. On the other hand, he may drop out because there is an abundance of equipment which is of no practical value in modern industry.

Perhaps the reason which is responsible for more losses than any other is the wrong type of instruction. There are too many schools that seem to think it is their business to tell students just what they should take; going on the assumption that most of them do not know what they want, or attempting to substitute something for the fellow who asks for a branch they do not like or want to teach. This assumption may be true, to a certain exent, with the one who is just taking up a new line of work, but upon careful examination it will be found that the regular tradesman does know what he wants or needs, and he will not waste much time in the evening class that cannot give it in a more or less direct way. It may be hard for him to explain just what he wants, but if the instructor will put himself in the place of the student, and imagine himself going thru the daily routine with the fellow somewhere out on the job, he will find he is better able to help analyze the job and the needs of the student for future advancement. A great deal of individual work must be done by both instructor and student. The instructor must be interested in the things that go to make up the daily life of the student. A whole lot can be accomplished in this way if the instructor will make it a point to show his interest by calling on his students as much as possible, while they are at work during the day to see for himself, just what their problems are. This is especially true with those who are working in power plants or similar places. In a great many cases the evening students will seek help in lines quite apart from

the primary work of the class and if the instructor knows, first hand, the conditions under which the student is working he can give many valuable suggestions that will help. The instructor who is in it merely for the extra money and has not enough time or interest to follow it up with a whole lot of outside preparation had better quit, for he is likely to be heading toward failure, as far as evening school work is concerned.

In several cases the writer has, at the request of the students, gone out into the plants where the men were working and helped them to solve some of the problems that have puzzled them. They were reluctant to go to their employer for fear he would misunderstand them and put them down as incompetent. This may be accomplished on a Saturday or at an evening visit, but first get permission of the employer for such visits. In this way the instructor can gather practical problems and the men can also be induced to bring in practical questions for class discussions which will be of great help to the whole class. When the student sees that the school is really interested in him he will be interested in the school and by thus giving it his whole-hearted support will profit greatly himself. Again, this sort of work will make a man take a new view of his own job. He will begin to go at it in a more analytical sort of way that will soon make him a more efficient and valuable man. The writer has heard of several instances where that very thing has nearly doubled the income of the student, for he cannot be enthusiastic about his work without putting more thought and energy into it and getting results which will bring him to the attention of his employer.

All theory, class discussions, etc., must be given from a practical viewpoint and put in shop terms to be effective. They must be of such a character and given in such a way that the student can take it right back to his job and put it into practice. That is his test; the only one he knows how to make, and if it doesn't work he is suspicious and is liable to say that "This school stuff is all bunk," and quit. In class discussions most evening students are timid or afraid of what the other fellow might think and therefore will not ask many of the questions they really want answered. In this connection the instructor who has had practical experience can, in many cases, anticipate the question that is in their minds and casually give it an answer. When this is successfully done it will be found that a new interest has been awakened and the instructor will have gained a great deal of added confidence from the class. Class trips to power plants, sub-stations, and large manufacturing plants will prove of great help and very instructive if a question sheet is prepared beforehand so that attention will be called to the particular thing which that plant can give.

To measure the success of an evening school solely by numbers is wrong and will result in failure, in most cases. The evening student works all day so the evening is his only time for self-improvement, and unless the class is kept down to a number that will give him a reasonable amount of the instructor's time, he soon begins to feel that his time is being wasted and gradually drops out. In this case it is always the best ones who drop out because they are the only ones who realize when their time is being wasted. The student of a little lower grade can be fooled and made to think he is getting a lot, but the "A grade" student who is working under modern system and efficiency in the business world cannot be made to think he is getting what he wants when he has to stand around and watch someone else work or work with someone who can talk about nothing but the last ball game or hunting trip. He is there to work and if conditions are such that he cannot work he will drop out.

In evening school work it will be found, by questioning, that comparatively few of the tradesmen make much use of trade magazines. Their usual reply is "They're nothing but ads." As a counter to this attitude the instructor can make a list each week, of good articles to read; that is, articles which are pertinent and of such a character that the class will understand them. Then take about fifteen minutes of the period for the discussion of magazine articles and show how they may be applied to everyday problems. It is surprising how such discussions will liven up a class and the men soon begin to realize that their plant or job is not the only one in existence. There is much to be learned from the other fellow. A large amount of this valuable material can be thrown on the screen with an opaque lantern.

The projection of a standard blue print or instruction card which comes with an A. C. starting compensator, generator, switchboard or some such apparatus will bring the class to their feet in a hurry. They will all have a question to ask about some particular part which bothered them on the last one they installed. In other words, "it's the thing they can take right home and use the next day that will interest them and help them on to a better job." Of course there are some who will come for just one or two subjects and when they get them will quit, but this number will be small. That sort of thing will not cause any serious interruption where the work is organized on a unit plan, and a great many of them will realize that there are several other units which will be of just as much use to them as the ones they came for and stay on.

An evening school should be organized with a view of its being as instrumental as possible in helping its students to improve their station in life and to live it more fully. If that thought is kept foremost in the minds of the instructors, with no effort spared that would help make it such, and to enlist the cooperation of the employers, it will have no trouble in holding classes. The trouble will come in trying to provide accommodations for them all.

Some Suggestions for Clothing Courses in 1921

Janet Cation Thurston and Rosamond C. Cook

I WISH every home economics teacher might read the article entitled "Let's Can the Coat Hanger," in the March, 1920, number of the INDUSTRIAL ARTS magazine. Then I should want her to go one step further and see what were the "coat hangers" in her course of study.

For two years I did extension work with women, and during that time I had a chance to find out what women did not know about sewing. Many times I wondered whether the next generation of women, notwithstanding their instruction in the schools, were going to be any better prepared to meet their clothing needs.

It seems to me that a pupil with a well rounded clothing education *may* know something about hand work, *but should know much* of clothing construction and have a thoro knowledge of the sewing machine, including the attachments. Why do the majority of teachers persist in starting on hand work as a prerequisite for construction work? These are not related and a knowledge of the former does not help one to understand the latter. I taught in one city system where 600 girls took sewing in the grades while forty took it in the high school. As I look back now I realize that I did nothing to help the 560 grade children solve their future problems, for the making of beautiful stitches today will not help them make clothing tomorrow.

It is appalling to find how little many women know about the sewing machine. In my extension work I gave many sewing machine demonstrations in the homes and in schools as well, and I may safely say that nine out of every ten machine belts needed tightening before I could sew. In the schools there are too many kind-hearted manual training teachers and janitors to whom the domestic-art teachers turn over this job, consequently a girl may get thru several years of sewing without knowing how to adjust a belt or that it ever needs adjusting. Pliers, stiletto and hammer should be in every domestic art equipment. Many teachers do not know that there is a tool for fixing machine belts. It is a combination of pliers, cutter and punch, easily handled and convenient, but not a necessity. It is worth investigating, however, since it is a time saver and not expensive.

The cleaning of the machine is extremely important if one is to do efficient work. I have seen machines in homes and schools so clogged with gummed oil that I could scarcely turn a screw, and the mechanism and the pan underneath were filled with lint and dust. A girl should be taught to respect a sewing machine and to realize that it gives service in proportion to the care it receives. She should care for it as a mechanic cares for his tools. In our home we never had a sharp butcher knife, and it is only since I have been married that I have learned the reason why. We did not know how to care for sharp-edged tools. My husband gasps when he sees the use I make of my fine set of knives, for he has been taught the care of tools by a tool-loving father. What a shame that I did not get this knowledge earlier so that I might have been passing it along the line in all of my former domestic-science classes.

Fig. 1. Home-made Dress. Cost $3.50. Made in 18 hours. Could not be duplicated in ready made under $18.00.

I recently called on one of my Maryland neighbors, the mother of eight little girls and one boy, and found her laboriously mending her son's trousers. I volunteered to show her an easy method of darning on the machine, but she replied, "My machine is threaded in white this week, for I am making Easter dresses for the six youngest." That woman with her large family of little ones had never learned to thread the machine automatically. The girls who learn to use the machine in the grades are not going to have that difficulty when they grow up, for we know that they can be taught to

wind a bobbin and thread both top and shuttle in five minutes, while threading alone need take but two minutes.

In past years I have been guilty of taking machine attachments out of the drawers of the school machines, so they would not get mixed or lost. Now I am convinced that machine attachments should be taught in any grade wherever there is occasion for their use. I was skeptical about this until I saw how a class of sixth grade girls used the binder in finishing the edges of their aprons, and binding them beautifully too! There is also a decided gain in time thru the use of machine attachments. In the past we have paid too little attention to the time element in sewing, and we have allowed the project to drag along and the child's interest usually has diminished accordingly.

I referred before to the machine darning. It is a splendid method to use in mending sheets, towels, table linen, and tears in clothing. It is done by merely tying up the presser foot of the machine so that it is about one sixteenth of an inch from the feed, and turning the stitch regulator to the finest stitch possible. This allows the work to be drawn back and forth or from side to side as the worker desires. The hole is filled in by putting in rows of stitching close together, first lengthwise then crosswise.

[1]See Bulletin, "Short Cuts in Sewing," Extension Department, Iowa State College, Ames, Iowa.

As I have heard many a tired mother remark when she saw machine darning, "What wouldn't I give to have known that ten years ago," I often think how fine it would be for the grade child to take home such information to the mother who does not have the opportunity of learning the new things in sewing. Hand darning should be taught, not in one grade but in each grade. I recall in one city where I gave a short course, one very young mother asking me to teach her how to darn. Knowing that she had had domestic-art training in the schools I asked, "Didn't you learn to darn in school?"

"It was taught in the seventh grade," she replied, "but I was absent that day."

One teacher at least is requiring the girls to darn one pair of stockings each week in order to form the habit of thinking of such things for themselves and of helping in the work involved in these necessary repairs.

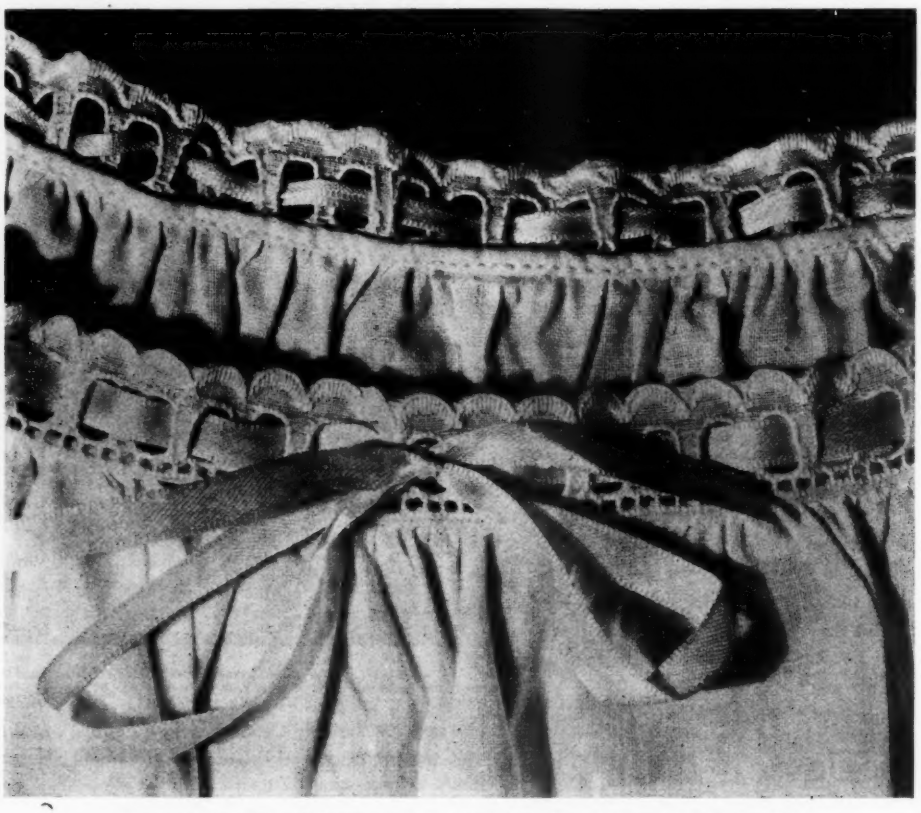


Fig. 2. Ready made nightgown, showing the good quality which was bought for $2.00.

Where must sewing reforms begin? I believe the start must be in the teacher training institutions. I made another interesting investigation as I traveled around Iowa, for I incidentally visited about three hundred schools a year. Without being told I could soon tell where a teacher had her training. If she were making a combination sewing bag and apron I knew she came from one school, and a certain type of cooking apron gave me the clue that that teacher was from another school as the apron was a model always used

by another of our Iowa teacher training schools. I used to regret that a teacher should continue, year after year, using the same models that she used when she left her training school, never realizing that because a school used a certain problem one year that it would continue to use that problem.

Anyone who knows about teacher training knows that we are always searching for new and better problems. I know of one domestic-art teacher who took her training by studying twelve summers in a big university. In her first position she went back to her first note books to get material for high school classes and started out with a superannuated draft for a middy blouse. When questioned about it she said, "Indeed it is all right, for I got this draft at the University of X." This happened less than five years ago in one of our prominent school systems.

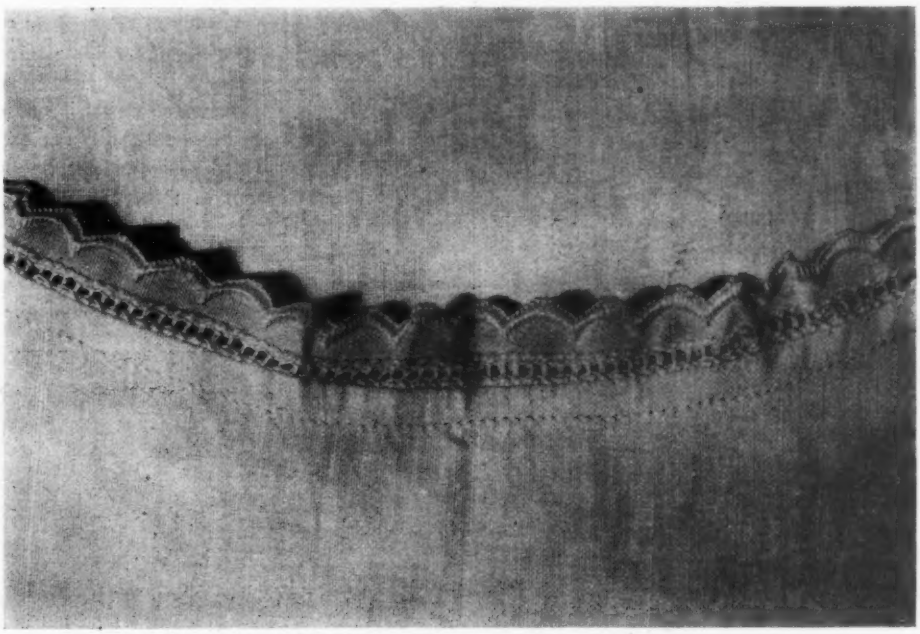


Fig. 3. Home made nightgown. Notice firm material, good embroidery edge.

The young teacher should not receive all the blame, however, for I have seen her in the smaller schools with a schedule that included history, accounting, business arithmetic, and geometry, all of these besides her home-economics courses, subjects she knew little about and must prepare herself for daily. Consequently is it any wonder that she lets down and resorts to her old note books for home-economics material? Would the more experienced of us do any better?

It is to be taken for granted that a teacher training institution will send out properly trained teachers. Such a teacher will have had much training in the use of the sewing machine with its attachments, also its care and repair. I know of one school where every Friday some class is made responsible for the cleaning and oiling of the machines. I know of another where at the end of the summer school an instructor asked, "Which class will be responsible for the final cleaning of the machines?" and the answer she received was, "Nobody needs to be; the machine company will send a man to do it before school opens in the fall." It is not difficult to know which school is sending out the best prepared teachers, nor creating the best attitude on a point that means so much to the student, not to mention the saving in expense to the school systems in which these teachers are placed.

Since in many cities classes are offered for girls who work and for women in the home, it is essential that a teacher know as much as possible about short cuts in sewing. A teacher can learn many of them in school, but she must be able to feel responsible for growth after she leaves her training school. It is most advantageous for a teacher to spend part of her vacation in attending a trade school or working with a good dressmaker. Why do not more teachers take the attitude that other professional people do? I was talking with a young dentist recently and he said he did not feel as if he could miss his weekly study club, altho he had been out of college only two years.

The teacher training institutions could do much for their teachers and for home economics work in general if they did follow-up work with an occasional letter with suggestions of new problems and better methods, or a news letter similar to those sent out by the extension departments of our state colleges, telling how teachers in the field are attacking certain problems and with what results.

I recall hearing a noted domestic science professor tell of visiting over twenty schools in a large city system

Fig. 4. Home made drawers for children. (Top.) Ready made drawers for children. (Bottom.) Both garments cost the same price. Good quality of muslin and embroidery in each.

the week peanut cookies were being taught. "Why peanut cookies?" she asked in each instance. The most frequent reply was, "Because it is lesson 27." In no case was there any reference to why peanut cookies were chosen or a comparison of the home-made as to price or quality with the commercial product.

We must take up the "whys" in clothing. What things should be made at home and what things will it pay to buy ready-made. Simple comparisons of value may be made even in the grades, but in high schools, colleges, and evening schools much stress should be put on this important phase of the work.

The following study was worked out by Miss Rosamond C. Cook of Iowa State College and shows one way of approaching the subject:

A woman recently duplicated a $2.50 ready-made dress for $1.72. She saved 72 cents but worked eight hours. The value of her time was nine cents per hour. Being a busy farm woman, she decided that it would be more economical to buy the ready-made dress and spend her time in more remunerative farm work. On the other hand, a business woman made a nightgown by machine in an hour and a half, duplicating a $2.75 garment, while the materials cost $2. She therefore earned the equivalent of fifty cents per hour and used time in which she otherwise would not have been earning money. This, however, is only one consideration.

In times past, when there was a wide range of materials at low cost, a woman could buy either materials or ready-made garments without the careful thought that is necessary under present conditions.

Economists who are working on the problem of the division of the income tell us that, altho we must increase the per cent we spend for some things, we cannot allow a proportionate increase for everything, and clothing is one item on which we can economize. Since the family clothing bill should still not exceed 20 per cent of the income and most clothing has increased in price at least 100 per cent the housekeeper has a real problem before her.

The woman who is spending every penny to the best advantage will need to consider whether it will pay her to buy material and make a garment either with or

Fig. 5. A duplicate of a $2.50 ready made dress on which 72c was saved.

without the help of a seamstress, or whether it will be more to her advantage to buy the garment ready-made. She will need to find out not only the value of her time, but will investigate the following points in order to make an intelligent decision: First, cost of each; additional cost for seamstress for home-made, or alterations for the ready-made; time spent in making or selecting a garment; appearance of the finished product.

Advantages of Home-Made Garments.

Many people do not add to the cost of material the value of findings that are on hand, trimmings that are bought at a later date, or unnecessary car fare to purchase forgotten supplies.

When a seamstress is employed, the cost of her services must of course be added to the cost of the garment. The initial cost may be reduced if the pattern is purchased and altered before the material is bought. If material is one dollar per yard, a quarter of a yard saved would buy silk thread and fasteners.

Further thought would include whether the width of the material would allow the most economical cutting. For example, one might be ahead financially by paying a larger price for 54-inch goods, instead of using 42-inch at a lesser price, to say nothing of the time saved in making piecings, and the appearance of the finished garment.

Does the material have a right and wrong side? An up and a down? Will the design match without waste of material? are questions which should be answered before buying.

On some garments there is such a slight difference between the price of the ready-made and the home-made that it does not pay to spend the time in making. These are usually the garments in which there is no great variety of either design or quality of material and which do not change from season to season.

One woman found that she could buy children's drawers for the same price as the material. On sheets and pillow cases there is practically no difference. Men's shirts and night shirts should also be considered in this class.

On the other hand, garments in which there is a great variety of design and material as well as a seasonal change can usually be duplicated for at least one-half the cost. The gingham dress shown in the illustration was made at a cost of $3.50, and probably could not have been duplicated in the same quality of material under $18. Approximately eighteen hours or a little over two days were spent in the making. A business woman who recently made a wool Jersey dress for a total cost of $12 concluded that she had earned $25 in the two days spent in making, when she found that it compared favorably in style and quality with a $37.50 garment purchased by a friend. From these illustrations it is plainly seen that the wise consumer will make some comparisons of her own to be sure that she is making garments that will pay her a fair profit for her time. She should assure herself, however, that she is making the garment in the least possible time.

Many women do not realize that much basting may be eliminated by pinning and pressing. The sewing machine attachments are time savers also, if one will become familiar with them. Then the worker should think the problem thru and arrange the work in such order

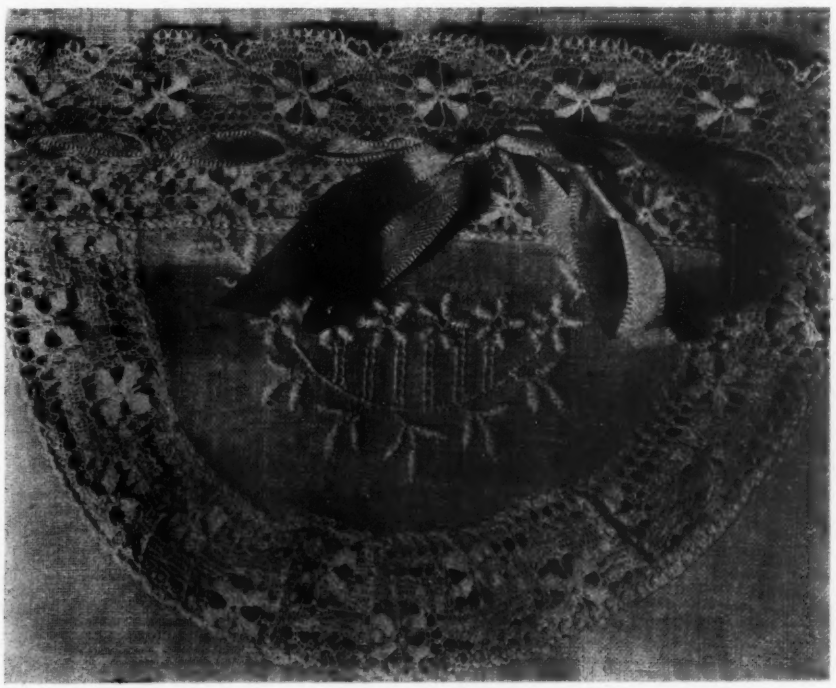


Fig. 7. Ready made nightgown. Coarse material, cheap lace, poorly sewed in.

Fig. 6. Detail of child's Princess Slips, showing difference in quality of material and trimming. Home made garments cost eight cents less, but will wear longer and look better than ready made.

that time is not wasted in other ways. For example, in making children's drawers or bloomers, put on the placket and finish the bottom of the leg before the leg seam is made, since it is much easier than after the leg seams are sewed up. In making nightgowns, put the fitted yoke or other finish on the neck and finish the bottom of the kimono sleeve before sewing the underarm seams. In a skirt with a front plait, finish the plait before sewing up the side seams. Stitch on pockets also before putting the parts of the garment together.

One great advantage of the home-made garment is that the growth of the child can be anticipated and provided for by such means as tucks or wide hems. Material will probably be left which can be used to good advantage for the addition of cuffs to worn or short sleeves or to replace the belt that has grown too tight.

The finished product is judged by the style of the garment, the quality of workmanship, the fit, the material, and the unusual finishes. Some people have the knack of making garments that meet these requirements, with others it may be acquired by close observation of styles in the magazines, studying well-dressed people to discover what it is that makes them look attractive and thru asking the advice of experts in such matters.

Buying Ready-Made Garments.

The problem of buying a ready-made garment is to find a garment that will meet one's needs and suit one's tastes, as well as come within the stipulated sum which one can afford to pay. The price paid for the garment does not cover the initial expense, for the alterations must be included. These alterations may be done at the store with additional charges, or at home when the purchaser's time should be computed and added. Even if the alterations are made in the store, buttons and hooks must be securely fastened, which will take time. Unnecessary time is often spent in buying on account of the habit that many women have of feeling that they must look everywhere before they buy, notwithstanding the fact that they frequently see the thing that suits them in the first store and return to it in the end. If the consumer puts a value on the time spent in making a garment, should she not make the same point in the selection of the ready-made garments?

In considering the workmanship of the ready-made garment, some of the points to be observed are:

Are the seams stitched deeply enough so they will not pull out? If there is a figure in the material, has it been matched in the cutting? Is lace or embroidery sewed on in such a way that it will not pull out? Are the plaits laid straight so they will hang properly and be pressed easily? More important still, have all the parts been cut correctly or has the manufacturer in his desire to economize on the material, shifted the pattern so that the parts which should have been on the straight of the goods are slightly bias? Is the material of the same quality thruout? The writer, during the past sum-

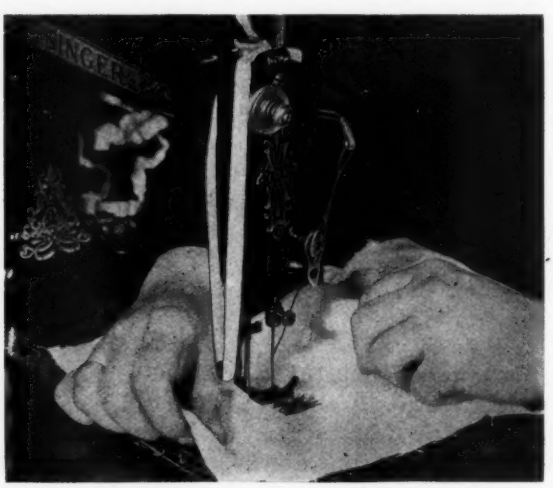


Fig. 8. Machine foot tied up for darning.

mer, saw a crepe de chine teddy that had a piece set in the back, and altho the price was around eight dollars and the garment had been purchased from a reliable house, the set-in piece was of very inferior goods. The inferior goods was not only in such a place that the hardest wear would come upon it, but it was in such a place that the purchaser would not be likely to discover it at the time of buying, the very thing that happened in this case. Are vests and collars easily removed for frequent laundering? A busy woman recently spent an entire day in removing a vest from a dress and making it detachable.

The quality of material in a ready-made dress is important. One must be a good judge of materials in buying ready-made because one does not have a chance to make the tests as in buying from the piece. One can at least avoid undergarments made of material so filled with starch that they will look like cheesecloth after the first washing. Look for a good firm weave, avoid materials that have a sleazy appearance.

An advantage of the ready-made over the home-made is that one has the opportunity of seeing the garment in a finished state, while in the home-made one can see it only in imagination. However, one's judgment needs to be trained to recognize the right thing in the ready-made as well as in the home-made. A well-dressed woman who buys for long service avoids extreme styles in either line, color, or trimming.

Besides the material in the garment one should notice the quality of linings and trimmings and compare them with the quality which would be purchased for a home-made garment. One can readily recall garments overtrimmed with cheap lace, or coarse, badly made embroidery when a simple firm edge would not only look better but wear better. Large stores usually carry garments trimmed with well made embroidery for the discriminating customer who makes her wants known.

It is certainly true that the designers of ready-made clothing use many interesting touches such as hemstitching, bound buttonholes used in unique ways, odd and attractive pockets, cable stitching, etc., which add much to the chic appearance of the garment.

It is only fair to add, however, that the commercial patterns are put out by firms who pride themselves upon the qualifications of the artists they employ, and whose training is the same in both cases. Moreover, with the exception of the machine embroidery there is scarcely a thing that the home worker cannot have for her garment if she is wide awake and alert. Hemstitching can be had for a few cents a yard, bound buttonholes and set-in pockets are mere matters of technique, and magazines give the methods of procedure frequently. Cable stitching may be made on any machine by winding the bobbin with the heavy thread and loosening the upper tension. Lengthen the stitch as well. The work is stitched on the wrong side, thus throwing the heavy embroidery thread upon the right side. These things all take forethought in the planning rather than special ability in the doing.

Fig. 9. Ready made nightgown. Costing almost twice as much as home made.

In order to put the problem of the comparison of values in a concrete way very few illustrations have been given. These will not meet the needs of every one but should at least show the thoughtful consumer the value of an investigation for herself. The individual problems will differ greatly, but every woman should discover whether she is spending *her* time and money to the best advantage. Her final decision in the matter can only be a fair one when she has based it on intelligent experiments of her own.

INDUSTRIAL-ARTS MAGAZINE

E. J. LAKE S. J. VAUGHN
Editors

EDITORIAL

TESTS AND MEASUREMENTS.

THERE is nothing at all in the sane application of tests and measurements that should disturb the teachers in the public schools or make their work more difficult. Indeed, under a wise and skilful administration of such devices, the teachers' problems should be greatly simplified.

The greatest dangers that will arise in connection with the aptitude and intelligence tests are sure to be due to the blunders and over-enthusiasm of the sensational novice, who accepts the findings of the present imperfectly devised tests and scales as the ultimate and infallible truth. Such persons often desire to appear learned in their familiarity with certain mysterious forces and practices.

As a matter of fact, those who have had most to do with the development and use of mental tests and scales and hence who know most about their significance, make absolutely no claim for their infallibility. They do maintain the correctness of the principles upon which by means of the tests properly applied under natural conditions and properly interpreted by competent people, children may be classified into rather distinct groups as regards inherent capacities and aptitudes.

Furthermore, in the main it may be said that the skilful use and interpretation of tests tend to verify the matured judgment of competent teachers formed from experience with the children in question. There are, of course, cases that vary widely from this statement. At best, the group tests of intelligence simply raise questions for further investigation concerning the intelligence and classification of certain pupils, who may appear in the tests, to be either above or below the normal of intelligence. If the results of such tests are placed at the disposal of skilful teachers who are in immediate touch with the children involved, they may become a source of very great aid to the teachers in solving some of their difficult problems. Likewise, they may bring relief and profit to numerous children whose improper classification and instruction they help to discover.

The teachers and the children of the schools should be freed from the imposition of those who study a few lessons by correspondence or who take a six weeks' course in a summer school, and thus fully equipped swoop down upon the community with their intellectual yard sticks.

By all means, let's have all that scientific research can devise in the matter of intelligence and aptitude ratings. Let's use the tests with a full understanding of their purpose and their significance and with an appreciation of their limitations. It is unfair to the children, the tests, and those who have developed the tests to use such devices in an unscientific way, to interpret the results without due consideration of all the elements and influences involved, or to make radical changes or reclassifications on the strength of the group tests without further investigation and verification. Properly used and interpreted, the aptitude and intelligence tests should become one of the greatest of modern educational aids.

THE SPRING REVIVAL.

Again the season approaches for the human animal to come out of his winter seclusion, take a deep, fresh breath of the south wind, bask in the sunshine, and watch things grow. If the industrial art teacher has enough influence and sets a good example, he may inspire a little vocational interest and activity in helping things grow to some definite purpose and plan.

Things will grow with no help. Nature provides the materials and conditions of growth. Man shapes and directs the forces of nature to his own purpose, or takes the haphazard results of nature as they come. The haphazard products of nature will no longer satisfy man's needs. There are too many of us to live off the ungoverned bounties of nature, or perhaps we are too luxurious in our habits of living to be satisfied with what we may harvest from untilled nature. We may be educated to appreciate the beauties of nature, but to sustain ourselves creditably we must do more than watch nature grow and become enthused over the beauties of nature. We have learned that another winter will follow this one and that unless something is done, nature will take another rest and our supplies will run short.

In spite of past experience, in spite of hard winters, there will be some who still advocate art without industry and industry without art. The revival of labor and learning, industry and art, has not yet reached the consciousness of all who have charge of education.

To some it is still adequate for the schools to develop the mind and senses to appreciate fine conditions without the skill to produce them. To others the skill of production is adequate, and appreciation is to be acquired thru experience with material things, as it may.

To the industrial art teacher, Spring is not only a revival of the activities of nature, to be enjoyed by taking a deep breath of the south wind and absorbing the sunshine. Spring is the invitation to direct the forces of nature so that her bounties may be enjoyed the whole year thru, and to develop the mind so that appreciation of those bounties will make every season delightful.

COOPERATION.

IT would seem unnecessary to urge cooperative effort at a time when organizations have multiplied as at present, for organization is but the endeavor to secure

cooperation of effort to do some particular thing. However, organization so often results in a few doing the work of many, rather than a fair division of responsibility.

The true leader does not stop with the machinery of organization. Unlike a mechanical device, every part of which is designed to perform a very limited function, the human organization must be composed of individuals, each having the interests, aspirations and conceptions of the whole organization. No capable member of an organization is satisfied to be a cog in the wheel. Our democratic standards cannot tolerate mechanical organization with a dominant centralized authority which considers the individual member as a mere name on the roster, to be used or neglected as authority may dictate. It is in this sense that democracy means individual opportunity to cooperate.

Cooperate we must! Organization should help us to the opportunity to cooperate. The school organization should be composed of the whole commonwealth. Citizens and teachers must cooperate or the schools will be but a few people's business and will represent the efforts and ambition of a few individuals.

Education, unlike some other human processes, may not be accomplished once for all and finally. It is a continuous development that applies to each person individually and to each generation in turn.

The teacher whose work is done when his class is dismissed is but a cog in the machine. The teacher who knows nothing of the whole educational process and cares nothing for other subjects than his own is not likely to be an effective teacher of his own subject.

The teacher of the industrial arts is especially subject to unfortunate isolation of his work and himself from other school activities. His subject has not yet become an integral part of the school curriculum in many communities. He can do much to make it so by taking active interest in the teachers and teaching of other subjects and in finding cooperation between his instruction and the instruction in other subjects.

No subject offers greater opportunity for cooperation of the school with activities of the community than industrial arts. The industrial arts teacher may even become a leader of industrial activity in his community and a valuable agent in correlating school activities and interests with the interests of the community.

TRADE EXPERIENCE.

So MUCH emphasis has been placed upon trade, or "practical" experience, that in many cases, all one has to do in order to secure a position as teacher of a shop subject is to assert that he has spent so many years "in the trade." The fact that a man has had six years of experience in a factory in this day of highly specialized shop procedures may be entirely without significance so far as teaching a trade is concerned.

Long experience as an operator of a sander in a furniture factory offers absolutely no preparation for teaching wood working in grade or high schools. Operating a monotype caster or a linotype machine or a platen press as a feeder is of itself no evidence whatever that such an operator is qualified to teach printing.

How much of a trade shall one know before he is a tradesman? Just what is the printing trade in these days? Shall a printing tradesman be expected to be skilled in all branches of this trade? Or shall the printing business be divided up into various groups of activities, each group of which shall be regarded as a trade?

The present terminology is very loose and inexact. The present scheme of industry renders it almost impossible to become a tradesman in the old journeyman sense. When teachers are employed, therefore, the fact that they have had so many years of trade experience should not be regarded as conclusive evidence of their ability to handle shop instruction.

The very least that should in reason be expected of those who come from the trades into the school work, is that their trade experience shall have been of such character as to furnish direct and specific training in the particular line of work which they propose to teach.

SYMBOLISM AND ART.

Art cannot dispense with symbolism; as the letters on this page convey thoughts to the mind, so do the things of this world, organized into a language of symbols, speak to the soul thru art. But in the building of our towers of Babel, again mankind is stricken with a confusion of tongues. Art has no *common language;* its symbols are no longer valid or are no longer understood. This is a condition for which materialism has no remedy, for the reason that materialism sees always the pattern but never that which the pattern represents. We must become *spiritually* illumined before we can read nature truly, and recreate, from such a reading, fresh and universal symbols for art. This is a task beyond the power of our sad generation, enchained by negative thinking, overshadowed by war, but we can at least glimpse the nature of the reaction between the mystic consciousness and the things of this world which will produce a new language of symbols. The mystic consciousness looks upon nature as an arras embroidered over with symbols of the things it conceals from view. We are ourselves symbols, dwelling in a world of symbols—a world many times removed from that ultimate reality to which all things bear figurative witness; the commonest thing has yet some mystic meaning, and ugliness and vulgarity exist only in the unillumined mind.—*Claude Bragdon.*

O brother, we must if possible resuscitate some soul and conscience in us, exchange our dilettantisms for sincerities, our dead hearts of stone for living hearts of flesh. Then shall we discern, not one thing, but, in clearer or dimmer sequence, a whole endless host of things that can be done. *Do* the first of these: do it; the second will have become clearer, doabler; the second, third and three-thousandth will then have begun to be possible for us.—*Thomas Carlyle.*

CHAIR BOTTOMS OF FLAT REED

Louis J. Haas, Director of Therapeutic Occupations, Bloomingdale Hospital, White Plains, N. Y.

BECAUSE of the variety of needs he must meet, the Occupational Therapist is ever on the lookout for crafts or modifications of crafts which he may add to his list and use. Some of these modifications of old and quite well organized crafts are often very interesting and may be of value to others. One of the crafts that has been of value to the occupational worker is the caning of chairs. This craft except as kept alive by the workers with the blind and in certain hospitals having occupational departments, has almost become a lost art.

A desire to produce a suitable bottom for chairs using some more easily procured material than rush led to the development of the bottom made of flat, split reed. This is an original modification of the close-woven cane bottom. It has the decided advantage of being a single fabric instead of a double one. The coarse, flat reed comes in good lengths and is more convenient to use, than either rush or wood splints. It produces a fabric that harmonizes well with the usual type of chair designed for rush bottoms. The bottoms made with flat, split reed are both durable and comfortably flexible. The texture of the reed lends itself readily to pleasing tones produced with wood stains.

To start work, the chair is placed on the table, and fastened securely so as to leave both the worker's hands free. A number of strands of flat split reed are rolled into rings and put to soak. The worker should have at hand a tack hammer, some fine wire brads about ⅜" long with large flat heads, and a large paper clip to which he may attach a two-pound weight. The paper clip with weight attached is used to retain the tension, as illustrated in the drawing C, plate No. 2, should it be necessary at any time to leave the work while the first stage is in progress.

The reed being pliable the first stage is begun thus: Mark the center of the chair upon the seat rails, front and back. Pass the strand of reed around the back rail at the center and pull forward, balancing the length of the reed above and below the rail. Tack it to the rail, driving the brad thru the center of the reed and into the under side of the rail. Take half of the strand above the seat rail and carry it forward and over the front seat rail at its center. Pull the strand quite taut, taking the strand down and around the rail, coming up on the inside of the rail and to the left of the taut strand. The reed is drawn close to the inside of the rail and then passed over the strand to the right and down, thus completely reversing its direction as illustrated at B, drawing No. 1 and in drawing No. 2, plate No. 1. It then passes around under the rail, coming up on the front side, continuing thus until three complete wraps have been made around the front rail, after the direction of the strand has been reversed.

Care should be taken to have these three wraps fit close up to the initial strand or warp strand, as well as fitting closely to each other. Then bring the strand around and over the top of the front rail once more, but this time just carrying it up and over the rail and then on, up to, and over the top of the back rail, at a point just two widths of reed from the initial warp strand. Take the strand around and up on the inside of the rail and to the left of the warp strand just laid down, taking every care to pull the warp strand taut. Continue to the left with the reed thus, until two complete wraps use up the space left between the strands for this purpose.

Upon coming up on the inside of the back rail for the starting of the third wrap, carry the reed diagonally across to the last laid strand, over it, and down, thus reversing its direction. See drawing, B, Plate, No. 2. Make

THE CHAIR AS CANED BY THE AUTHOR'S METHOD.

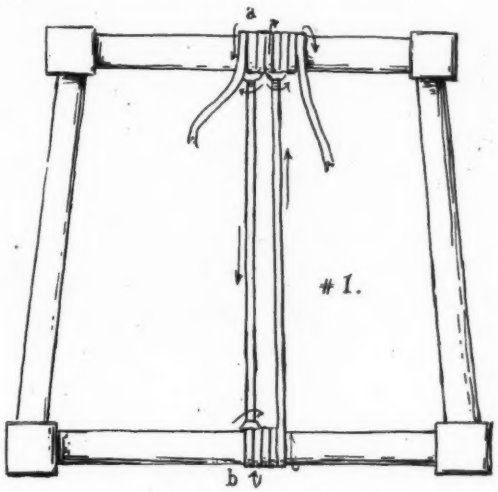
two complete wraps around the back rail, close up to the last warp strand on its right, and on coming up for the third wrap, take the strand across to the front rail. Take the strand over the front rail to allow sufficient room for three spacing wraps to its left, between it and the last laid warp strand. After making the three spacing wraps on coming up on the inside of the rail, pass diagonally to warp strand just laid, pass over it, and down. Having reversed the motion, make the necessary three spacing wraps, and carry the strand over to the back rail, spacing and reversing as explained, continuing thus until the right-hand side of the chair is reached. Whenever it is necessary to stop the work for a few moments the tension may be retained by snapping the paper clip with weight, to the reed, as illustrated in drawing C, Plate, No. 2.

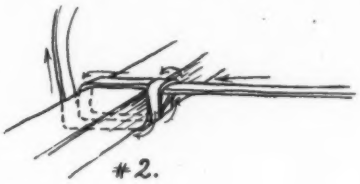
It will be necessary, as the work proceeds, to add new strands. This is best accomplished in this manner: When the exhausted strand has been passed over the rail, attach the weight to retain its tension, and then place the new strand in a diagonal position on the inside of the rail facing in the direction of the wrapping, tacking in place with one brad placed under the warp strand. Now take the exhausted strand and make two spacing wraps, passing over the new strand, letting the third wrap pass under the new strand, then cut off the surplus of the exhausted strand as shown in drawing 3, Plate, No. 1. The new strand is now wrapped over the old one as shown in drawing 4, Plate, No. 1, and a tack is driven thru both strands on the under side of the rail. Work now proceeds as before.

It will be noted that by this method of splicing a new strand, the ends of both strands are wrapped in. Both the tacking to, and the friction of the reed upon the chair rail, holds the two ends firmly in place. This form of splicing may be modified to meet the needs of this stage of the weaving, as well as those of the next stage. The left side of the chair bottom is warped thus: Take the under half of the original strand, bring it up on the inside of the rail to the right of the warp strand, carrying it over, and down on the right side and then make two

spacing wraps before taking it to the front rail. Drawing 2, Plate No. 1 illustrates this reverse. Now the warp strand passes over the front rail at a point just three wraps from the central warp strand, and the spacing wraps are made to its right. When the spacing wraps have been made, the strand passes to the left, over the warp strand, and down, to make the reverse. The work then proceeds in the manner described above with but this change, that the strands are being laid on the rails moving to the left of the center, instead of to the right.

When the left side of the chair bottom has been reached, it will be noted that the strands end on one side at the back rail and on the other side at the front rail. The next stage of the weaving should begin at the front and work toward the back. Therefore, the surplus of the warp strand which finishes at the front rail may be used.





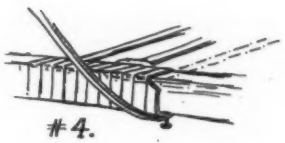


Plate No. 1.

Drawing A, Plate No. 2 shows that the strand finishes at the front on the right side of this chair bottom. If another warp strand had been needed, it would have simply reversed this. After the three spacing wraps have been made between this warp strand and the preceding one and the reverse has been made, the remaining space on the front rail is wrapped and then the strand is passed under the front rail, inside of the chair leg, under the side rail, out, up, and over it and the reed is transformed, or becomes a woof strand. The strand is kept as close to the chair leg as possible, carried over the nearest warp strand and under the next, alternating thus, over and under until the other side of the chair is reached. The strand is pulled taut, passed over and around the side rail and kept close to the chair leg.

It now becomes necessary to reverse the strand. This is accomplished as follows: hold the strand taut with the thumb upon the top of the rail and the fingers underneath; pass the end of the strand up between the woof strand and the front of the chair, pull up taut close to the side rail, pass the strand over the woof thread towards the back of the chair and hold down hard upon the woof strand with the thumb of the left hand, which has been released from the former operation. This will keep the strand from slipping when it is passed down and under the side rail to reverse its motion. The reversed strand now comes out, up and over the rail, being held taut with the thumb and fingers above and below the rail, while it is woven over and under several of the proper warp strands. As soon as this is done, and the strands are pulled taut it will hold its tension at the side rail just left without the aid of the operator's fingers. This leaves both his hands free for the weaving which proceeds best if one hand is kept under the chair and the other above the chair, passing the end of the reed up and down without delay.

Care must be taken to start the reed so that it will not be twisted during the weaving. The chair caner's habit of pulling the reed thru the fingers until its end is reached, is the best habit to form, and that coupled with the use of a small amount of the end of the reed, will eliminate twisting mistakes. When the strands are pulled taut as much tension should be given them as they will stand; this is necessary in this stage as in the preceding one. The strand should only be used when quite pliable and when a strand gets dry while using, it should be softened with a sponge and warm water.

Reed seems to expand principally in thickness and width; for this reason the strands unless pulled very taut will when dry become loose on the rails and sag. It is quite possible to pull sound strands of flat reed taut enough to eliminate the possibility of this slackness appearing when the chair bottom becomes dry. None but perfect strands should be used.

When the right-hand side of the chair is reached and the strand has been pulled taut about the side rail, the reverse is made. This reverse is made slightly different from the one just described above for this reason: The drawing A, Plate No. 2, shows that the first strand ended on the left by passing over the last warp strand as well as the side rail; thus it is an advantage to have it tied down between these two points with the band caused by the reversing of the strand. This is not true of the second woof strand; it ends by coming from under the last warp strand. It will be noted that the first woof strand starts on the right by passing over the rail and the warp strand. For the above reason the reverse is made around the first woof strand instead of the one just laid. This reverse is made by passing the strand between the leg of the chair and the first woof strand, up over it, and down between it and the second woof strand. It is then brought under and out and around the rail, and over the first warp strand. Then the weaving proceeds. Thus the reverse on the left is made by passing over the woof strand just laid, while on the right the reverse is always made by passing over the woof strand next preceding the one just laid. This is done in both instances because it divides and pulls down the long section of reed which would otherwise appear; thus eliminating a place in the weaving which would catch buttons and cause much annoyance.

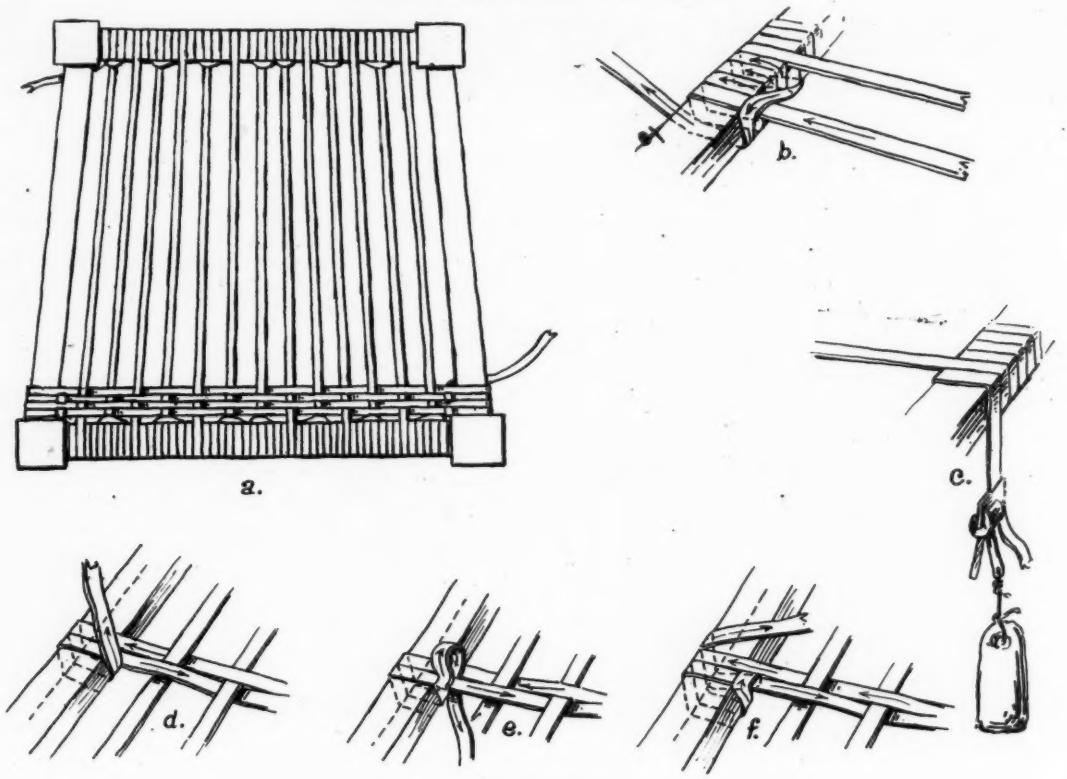


Plate No. 2.

When the last regular woof strand has been placed, it will be found that unless the inside face of the back rail is flush with the inside surface of the legs of the chair, a certain space remains. A filler strand may be woven in, and for this the surplus of both the one warp end and the woof strand may be used, working from both sides towards the middle. When the middle is reached, the two strands may be made to overlap each other about four warp strands, and then cut so that their ends will be covered. This will serve to securely fasten these strands. They should also be tacked to the rails. The space which will also appear in the front of the seat is filled by weaving a short extra strand across the whole width of the bottom. The ends of this strand are passed down close to the legs and held to them from underneath the seat with a tack.

Having finished the weaving, turn the chair upside down, and as an added insurance against slippage, drive a tack thru the strands every two inches into the under side of the four rails of the chair bottom.

While the reed is still moist it is singed with an alcohol lamp to remove the whiskers from the reed. These whiskers are the result of the handling of the reed and can best be removed in this way.

When the seat is thoroly dry it will be found quite flexible and comfortable. Finally it is given a coat of Bridgeport's weathered-green-oak wax finish stain, which brings out the full beauty of the texture of the reed. The stain gives the reed just that delightful tone so much admired in the old rush bottoms, while the texture of the reed fabric harmonizes equally as well as does the rush with this type of chairs.

PROF. C. A. BENNETT ADDRESSES OKLAHOMA CONVENTION.

At a recent convention of Oklahoma art and manual arts teachers, Prof. C. A. Bennett spoke on "Education for Appreciation as Well as Production." According to Prof. Bennett, American life stands at the threshold of a new era which promises much more than material changes. Thru the agencies of new laws affecting social habits, new means of transportation and recreation affecting leisure hours, and new national experiences affecting the spirit and outlook of our country, the time has come for "the leaven of uplift to do its work—for popular culture to come to its own."

The eight-hour day has given the working man eight free hours for recreation and the things which are "more than meat." The movie has translated life and literature into vivid experiences and spread them out before us all. The automobile has brought refreshment of mind and body to the city man and new opportunities for culture and advancement to the country man. The great war with its attending world problems has deepened our love of country and broadened our outlook on the world. All of these new conditions and experiences lay great obligations upon the school to educate for the appreciation of the best things in life.

True culture must therefore be a larger element in education, but the practical side of culture must not be overlooked. The culture which gives appreciation of work well done must be a large part of the program of the manual arts courses in the intermediate and junior high schools, contended Prof. Bennett. "The same civilization, the same life that demands greater vocational efficiency for eight hours a day and for all workers is going to demand a higher cultural level, a finer appreciation of the arts of civilization for all workers during the other eight hours," said Mr. Bennett. Our manual arts courses need to be made richer for cultural reasons, for in these days we must remember that "life is more than meat."

At the Hooker School Annex of the Springfield, Mass., Vocational School a large class of rehabilitation students has been enrolled. The men have shown great interest in the work, particularly in the machine department. A large number also are attending the drafting department. According to the Smith-Sears Act, any man disabled while serving in the army or navy before the world war as well as in the future will be entitled to vocational training on the same basis as those disabled in the world war.

PROBLEMS AND PROJECTS

The Department of Problems and Projects aims to present each month a wide variety of class and shop projects in the Industrial Arts. Successful problems are invited and will be paid for. A brief description of constructed problems, not exceeding 250 words in length, should be accompanied by a good working drawing. The originals of the problems in drawing and design should be sent.

Problems in benchwork, machine shop practice, turning, patternmaking, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work, and other lines of industrial-arts work are desired for consideration. The editors will not accept the old hackneyed problems of footstools, taborets, towel holders, etc., which have been made from time immemorial, ad nauseum.

Drawings and manuscripts should be addressed: The Editors, INDUSTRIAL-ARTS MAGAZINE, Milwaukee, Wis.

FORGING A SMALL AX.

H. C. Gibson, Walla Walla, Wash.

The forging of an ax is not as difficult for an advanced pupil, as it may at first appear. But it is of great value in teaching them to weld tool steel to iron, or low-carbon steel. The use of the emery grinder and buffer for finishing is also taught.

For the ax shown, take six inches of $\frac{1}{2}''$ x $2\frac{1}{2}''$ iron, or soft steel, mark off two inches in center. Use $\frac{5}{8}''$ fuller and draw one-half of eye, on each side of the marks, leaving the walls 3/16″ thick to allow for welding and finishing.

After each side has been fullered to the required size, scarf the ends, allowing the stock to widen to permit of a flare.

Heat the center and cut in $\frac{3}{8}''$ with hot chisel, on the side opposite from the eye. This will allow A-B to be brought together very easily, properly forming the eye. Raise to a welding heat, at the pole of the ax, and weld together. (It is well to have an eye-pin at this time, the proper size and shape to keep the eye in the proper form).

Now take three inches of $\frac{3}{8}''$ x $1\frac{1}{4}''$ of tool steel, scarf one edge and insert between A and B, and raise to a welding heat, as far back as the eye, using plenty of powdered borax on the tool steel to keep it from burning. In welding, a few blows are necessary on the edges as stock should be allowed to widen to obtain the proper shape when the bit is drawn to the proper dimensions.

Heat, harden, grind and buff or polish.

The proper temper can now be obtained by applying hot pieces of metal, drawing to the desired hardness. The edge of the steel should not be drawn too thin before hardening, to guard against a possible crack.

A LIBRARY TABLE.

Don A. Sloan, Great Bend, Kans.

This table was originally developed to afford a problem worthy of the mettle of capable, advanced students in cabinet work and turning. The design was worked out to require a high degree of accuracy, skill and neatness. The lathe work on the legs is simple, but must be done carefully so that the four are exactly alike. The band sawing of the rails, the dovetailing of the drawer and the knock-down construction all involve careful machine and handwork.

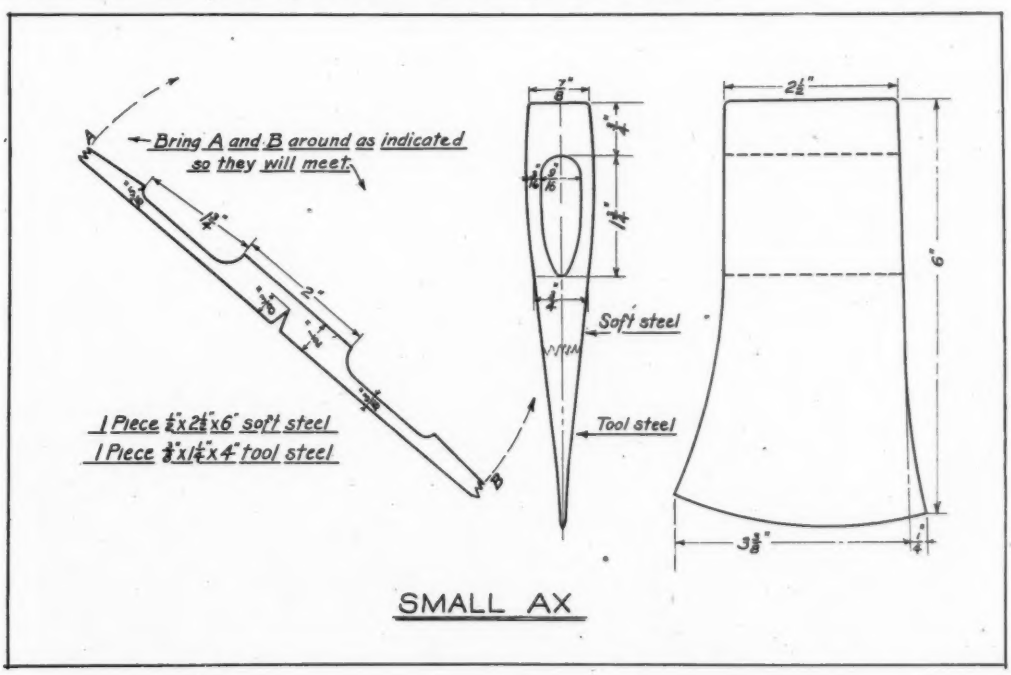
LIBRARY TABLE MADE BY MR. SLOAN'S STUDENTS.

1. To make edge on top, place the straight edge on top at the right distance from the edge and clamp; use bull nose pins.

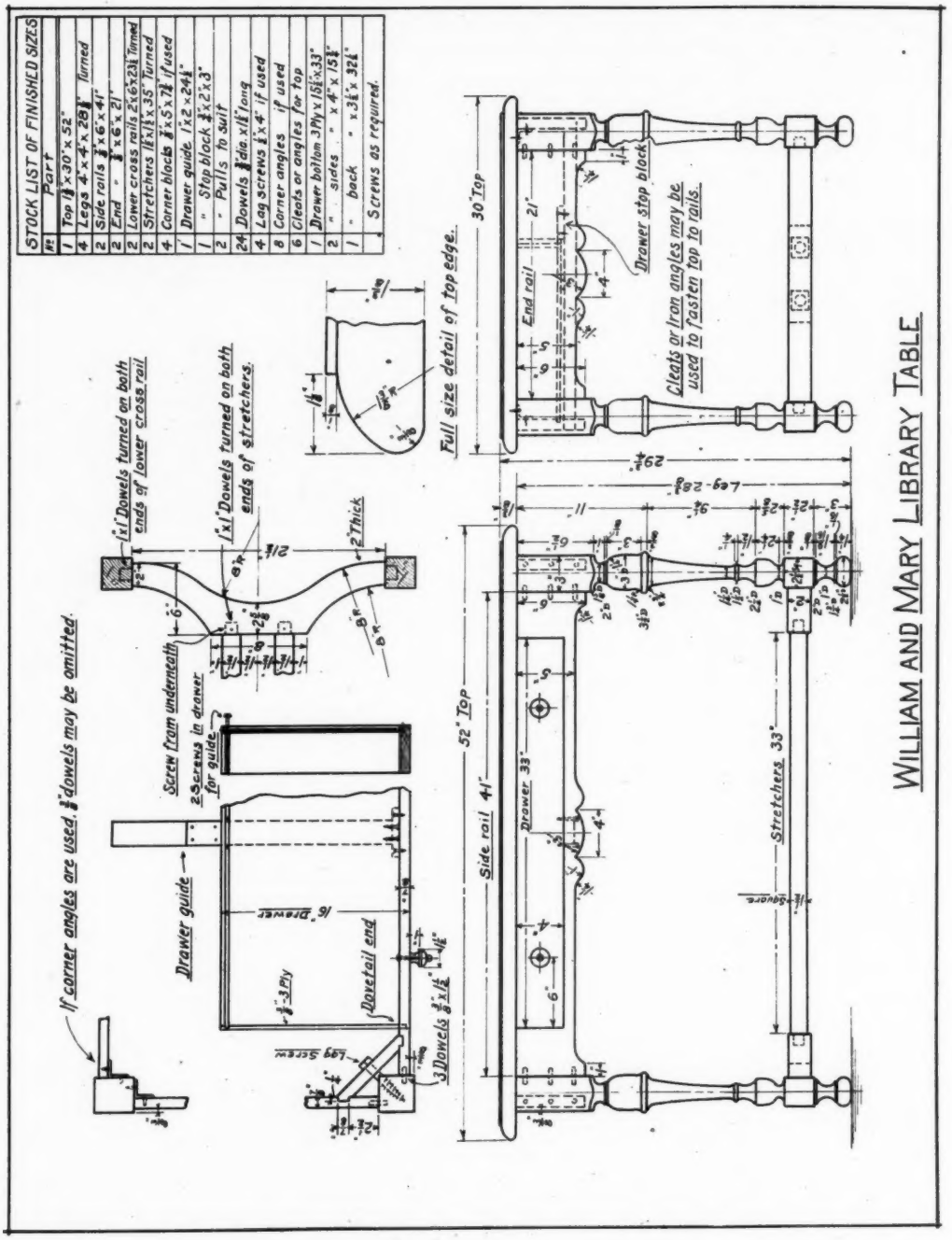
2. In laying off legs, lay off all four before attempting to turn.

3. Draw the pattern of the rail on cardboard and transfer for exactness.

All assembling was made on the lower rails, by setting a screw from beneath thru the dowel. The construction shown for the drawer will not bind even when opened by one knob.


Bring A and B around as indicated so they will meet.
1 Piece ½"x2½"x6" soft steel
1 Piece ⅜"x1¼"x4" tool steel
Soft steel
Tool steel
6"

SMALL AX

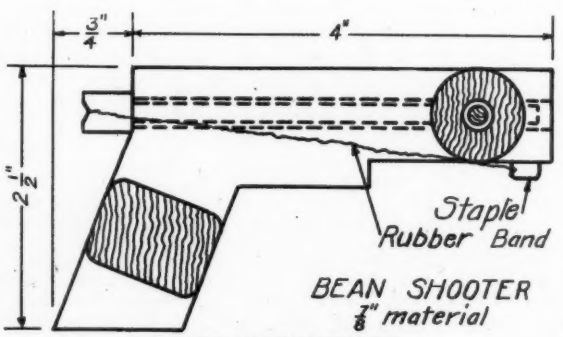

STOCK LIST OF FINISHED SIZES
No. Part
1 Top 1" x 30" x 52"
4 Legs 4" x 4" x 28½" turned
2 Side rails ¾" x 6" x 41"
2 End " ¾" x 6" x 21"
2 Lower cross rails 2½" x 6" x 23¼" Turned
2 Stretchers 1¾" x 1¾" x 35" Turned
4 Corner blocks 1" x 5" x 7½" if used
1 Drawer guide 1" x 2" x 24½"
1 " Stop block ¾" x 2" x 3"
2 " Pulls to suit
24 Dowels ⅜" dia. x 1½" long
4 Lag screws 1½" x 4" if used
8 Corner angles if used
6 Cleats or angles for top
1 Drawer bottom 3 Ply x 15½" x 33"
2 " sides " x 4" x 15½"
1 " back " x 3½" x 32½"
Screws as required.
Full size detail of top edge.
30" Top
Drawer stop block
End rail
Cleats or iron angles may be used to fasten top to rails.
1" Dowels turned on both ends of lower cross rail
1" Dowels turned on both ends of stretchers.
2" Thick
Screw from underneath
2 Screws in drawer for guide
Drawer guide
16" Drawer
Dovetail end
¾" 3 Ply
Lag Screw
3 Dowels ⅜" x 1½"
If corner angles are used, ⅜" dowels may be omitted.
52" Top
Side rail 41"
Drawer 33"
Stretchers 33"
WILLIAM AND MARY LIBRARY TABLE

Walnut, finished natural, or quartered oak finished in Pratt and Lambert acid stains. Fumed oak with a two-coat shellac (rub) varnish (rub) wax finish, show up to the best advantage. These are merely suggestive as to the best way to make the particular table. The turning is the real problem.

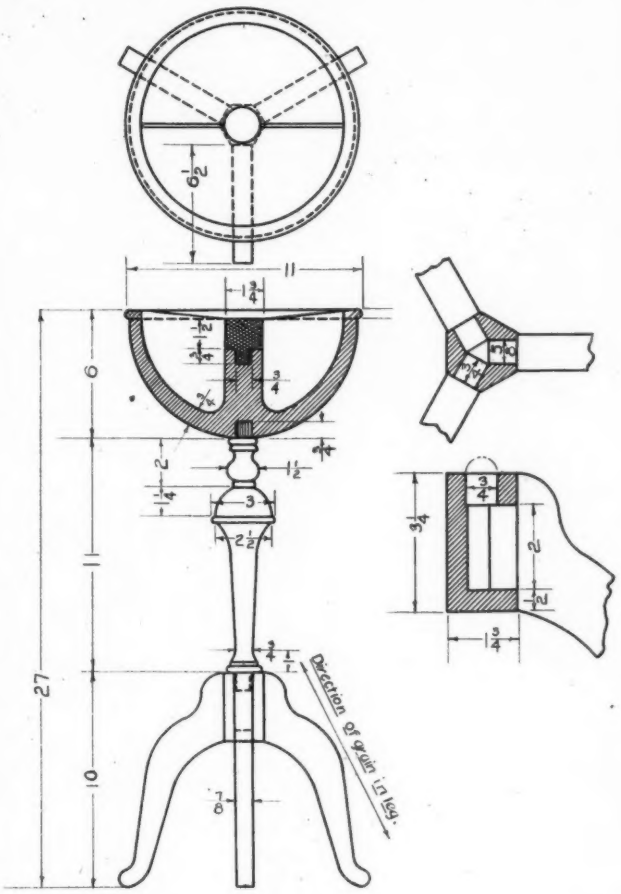
A BEAN SHOOTER.

Stanley Mythaler, Director of Manual Training, Valley City, N. D.

We have found the bean shooter interesting in the grades and desirable because it utilizes scrap material. A tin pattern may be used to aid in laying out. If the plunger is notched just back of the forward end it will stay cocked.



DETAILS OF BEAN SHOOTER.



THE NUT BOWL READY FOR USE.

NUT BOWL ON STANDARD.

F. E. Haines, Muskegon, Mich.

The following is the description and best methods of constructing the nut bowl with standard as shown by the accompanying working drawing.

The bowl is turned from a block of wood preferably walnut or mahogany but any wood is acceptable. It is glued up of lumber ¾″ in thickness, having the grain in each alternate piece crossing the grain in the previous piece at right angles. The block should be about 11½ by 11½ by 7 inches in the rough. After gluing the stock a circle 11½″ in diameter is scribed on one side and then cut out on the band saw. The block is then screwed to a face-plate, care being taken that a large enough face plate is used to insure proper strength for the size of stock being turned. The outside of the bowl is turned to 11″ diameter first. The inside is then hollowed out with a ½″ round-nose tool leaving the center projecting to receive the metal anvil. It is better to first cut a template from cardboard or ¼″ lumber to insure getting the proper shape for the inside of the bowl. A ¾″ hole should be turned in the end of the projecting center to receive the corresponding projection of the metal anvil. The inside is then sandpapered. The bead is turned on the outside of the bowl and the outside of the bowl is turned down to the proper curve as near as the faceplate will allow. The face plate should then be removed and a chuck turned on the faceplate from some soft wood preferably pine. It is turned to the exact size of the inside of the bowl and should fit in about an inch very snug so that the bowl will stay on the chuck during the turning process. The bowl is pushed tightly to the shoulder on the chuck in order to be sure it will revolve perfectly true. If necessary four small brads can be driven thru the rim of the bowl into the chuck to make absolutely sure the bowl will not slip off and break. The outside is now turned to the proper shape and dimensions and sanded, care being taken to work the material slowly to avoid any chance of breaking the bowl. By placing a No. 12 bit in a Jacobs chuck in the tail stock of the lathe, the hole in the bottom of the bowl may be bored to receive the pin on the end of the post. Pull out the brads and force the bowl from the chuck.

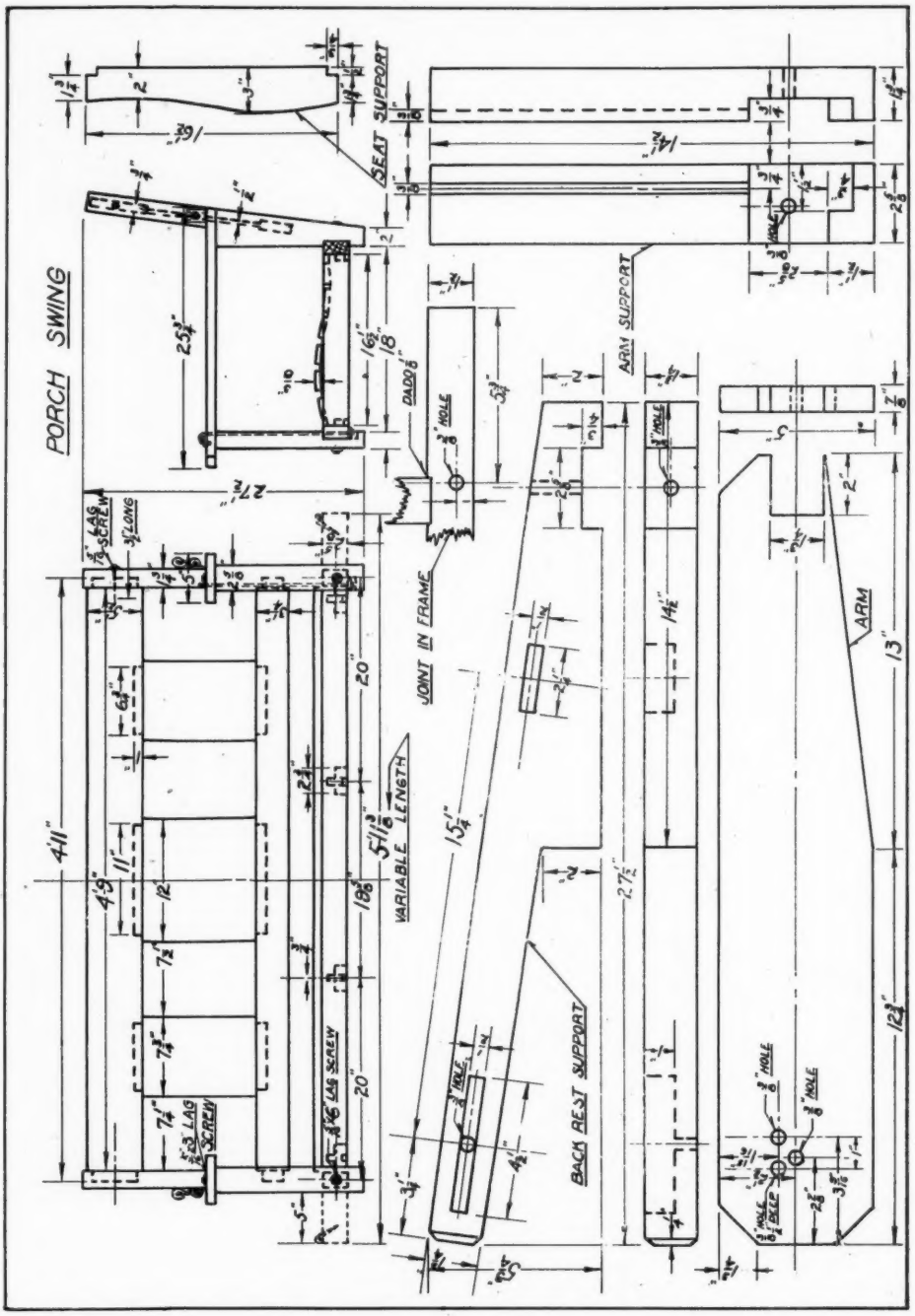
The post is turned to dimensions with a ¾″ pin on each end. It can be turned William and Mary design or to correspond to any other design of dining room furniture you may wish it to resemble.

The block at the bottom end of the post is hexagonal in shape. Mortises are cut in the three sides as shown, to receive the tenons on the legs.

The legs are cut from ⅞″ stock, the grain running in direction shown by drawing as an element of strength. The mortise and tenon joints should be well made in order to withstand the pounding.

The anvil may be made of iron, copper, or brass and is turned to dimensions given. It should fit snug into the hole bored in bowl.

Two partitions of ¼″ stock are cut to fit between the anvil on the supporting center and the outside of the bowl. These are braded into place from the inside, and divide the bowl into two compartments, one to be used for nuts and the other for shells, thereby eliminating the necessity of having an extra container for the shells.



The different pieces should be glued together, stained and given two coats of varnish and rubbed down with pumice and rotten stones.

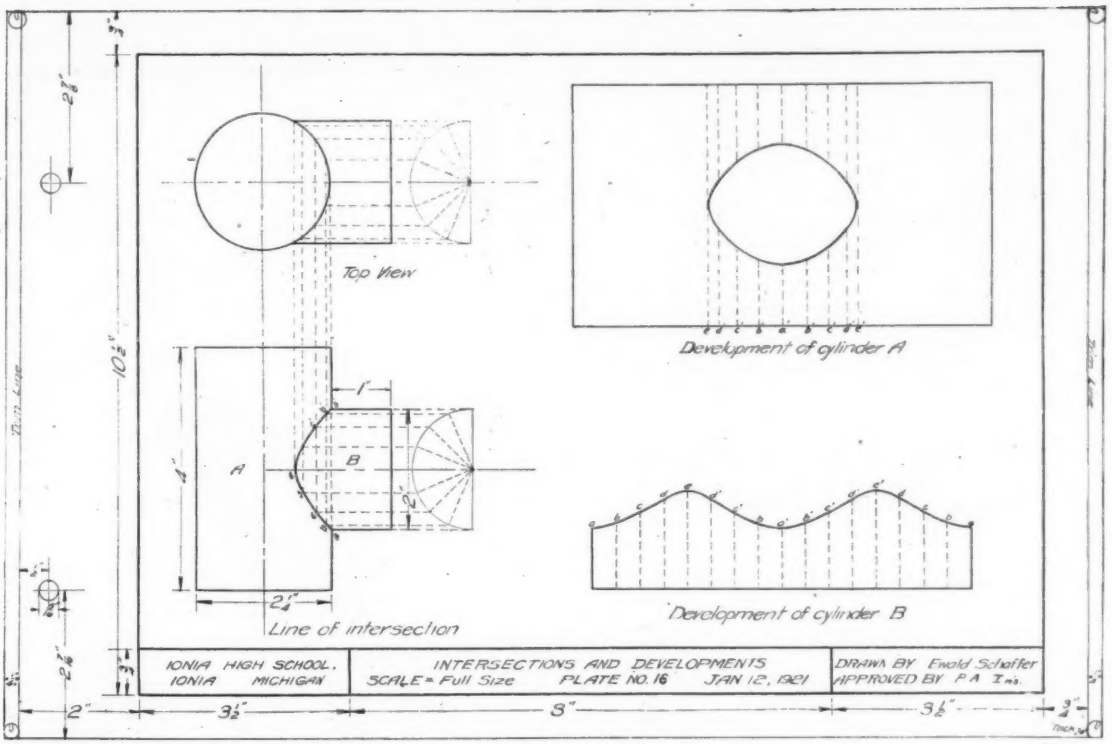
A small metal hammer may be hung on a hook screwed into the bottom of the bowl. This nut bowl is a convenient, practical as well as an ornamental piece of furniture suitable for any home.

PORCH SWING.

Frank W. Walsh, Oshkosh, Wis.

This swing has made many good friends among its builders as well as its users. For its lightweight, simplicity of construction and design it is to be commended. The inclined back, depth and curve of seat, height and width of arm-rest, height of back and four chain suspension make it very comfortable. It is easily taken down to be packed in small space for shipment or storage. All of the rough stock can be ordered from standard stock carried at all lumber yards. This is the result of experience in building about thirty swings of all styles and methods of assembly and suspension.

All of the heavy pieces are cut from a 2″ x 6″ x 14′-0″ or 16′-0″ piece of material depending upon the length of the swing bed. Beginning at one end of the piece, lay out the back rest supports first and cut them off. Cut lengths for arm supports, long bed pieces and cross bed pieces, then these pieces should be ripped down the center and planed up. All other pieces are cut from inch or half inch stock and planed smooth. The back rails may be


Top View
Development of cylinder A
Development of cylinder B
Line of intersection
IONIA HIGH SCHOOL. IONIA MICHIGAN
INTERSECTIONS AND DEVELOPMENTS SCALE = Full Size PLATE NO. 16 JAN 12, 1921
DRAWN BY Ewald Schaffer APPROVED BY P A Ins.

WORKING DRAWING OF TITLE BLOCK.

rabbetted on the saw then filling blocks be glued in the grooves between the panels. In place of the front supporting rod extending through to the bottom of the bed piece a short, hooked draw bolt may be used, inserting a nut thru a hole bored in the back of the arm support. The back is assembled first, the back bed piece is put in place then the short bed pieces followed by the front bed piece and the arm supports. The arm rests are placed, then the supporting brackets for the seats are placed and the seat slats bradded or screwed on the curved supports.

For a reliable porch ceiling support we have found a piece of one inch seasoned ash four inches wide and long enough to reach three of the ceiling joists, lag-screwed at these three points, to be satisfactory. The ceiling plate hooks are screwed to this piece with the same relative spacing as the points where the chains are attached to the swing. The height of the swing from the porch floor is very important in the matter of comfort.

The design is simple but lends itself readily to additions such as placing panels in the ends between the arm rests and the cross bed pieces or changing the panel effect of the back or changing the over-all length of the swing. However, the comfort alone well repays the builder for his labor.

Caution: If the long bed pieces are to extend thru and supporting chains attached to them, safety chains should be attached to the back rest supports from the rear chains.

THE TITLE BLOCK vs. THE ARRANGEMENT OF VIEWS.

Percival Angove, Instructor Mechanical Drafting, Ionia High School, Ionia, Mich.

Mechanical drafting is a language in itself, and when we attempt to write and read this graphic language thru the aid of mechanical appliances, it should be as all other languages, clear and concise, yet in its simplest form. A drawing which is to convey a meaning should be made in such a way as to be easily understood, eliminating the unnecessary details. The drawing should check itself in such a way as to leave no figuring or even unnecessary scaling.

The alphabet of lines is to be strictly adhered to. Correct method of dimensioning is important. The scales should be sufficiently large to show every detail clearly. Kind of material and number of each part must be indicated. Unnecessary views have no place upon the drawing. Only the necessary and explanatory notes must be given and in a place upon the plate that will not confuse the drawing. But how about the arrangement of views and their place upon the plate or print? Of course, every drawing must have a title. The form and size varies, yet how many teachers are continuing to use the old style, regardless of its disadvantages, of boxing the title in the lower right hand corner. This form and location is used more often in classwork than any other, and how often it necessitates either breaking into the third view or crowding the views towards the left hand side of the plate in such a way as to make the finished drawing look like a conglomeration of lines that will take much time to read, and perhaps convey the wrong meaning. This is often the case, especially in the drawing of a plate where the three views and developed surfaces of the object are required.

What is the matter with making the title block and record strip all in one, to reach across the entire length of the drawing, upon the lower margin line and under the drawing as per illustration?

A well composed drawing upon a plate is a drawing whose views are far enough apart to distinctly separate them from each other, and arranged about the center of the plate with a wide enough space between the margin and the drawing outline on all four sides to make the drawing appear the most dominant feature. In other words, that which is to be understood and read by any workman should stand out in a bold, clear and concise manner.

We often lose sight of the fact as teachers that we should emphasize drafting as a means to an end as far as a finished product made from the drawing is concerned, as well as the teaching of the principles involved thru classroom practice.

It is one thing to be able to make a drawing and another thing to be able to read one clearly. A workman is supposed to read drawings, of course, but very seldom can he make one. Therefore, the drawing should be simplified as much as possible.

The accompanying drawing will explain itself. Perhaps a more complicated drawing which would involve a three view working drawing plus an auxiliary view and the developed surfaces, would have made the title strip more necessary. The drawing illustrated is one actually made in the author's classes and shows the style and size adopted. The original size of the plate is 12"x18¼", and after allowing for a margin the size of which is indicated upon the drawing, it will be readily seen that in order to have the working space 10½"x15" that the only waste is the one-fourth inch strip on each end, which is to be removed after the drawing is completed. This strip insures the only space for scratching, trying out pens and for the placing of the tacks, etc., there being no waste on the upper or lower edge of the plate. The two-inch margin is allowed for the binding holes, as a portfolio of all the plates is made at the end of the year's work. Of course, the size and shape of the plate may be varied but the record strip and title block could still be together. You will find that the size of the plate, as indicated, is a very convenient size for most drawings and will allow space for the nonconfusing of views, "provided the strip is used." The illustration does not necessitate many notes, but in case of a working drawing where the third angle projection is used, the drawing could be composed about the center of the plate and the space above the third or side view reserved for notes.

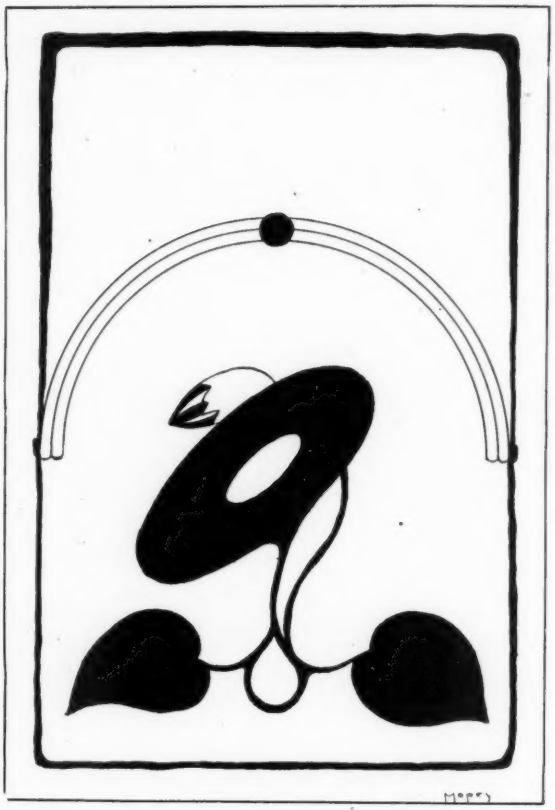
BAG MOUNTING.

Bertha Morey, Ottumwa, Iowa.

Satisfactory bag tops may be made by cutting a pair of embroidery hoops in half; round off the corners and smooth with sandpaper, drill a hole in each end in the same position.

The best, most durable and easiest covering for the half hoops is velvet ribbon wide enough to fold around the hoop. The hoop may be padded or shaved slightly to fit the ribbon. Turn in the ends of the ribbon and overcast the edges of the ribbon. Before sewing the bag to the top the two parts of the top must be fastened together at the ends. A small button to match the top covering should be strung on six strands of buttonhole twist, then all twelve of these strands threaded thru both the drilled holes of the top and separate into the original six strands. Sew one bunch of the threads thru a small button and tie with the remaining threads into a hard knot, however, leaving it so that the hinge will work. A round button and loop forms the top fastening. Velvet ribbon may be sewed to the frame for the handle.

For most bags round hoops make the most suitable tops. The oval hoops are even more interesting and may be cut either thru the long or the short way.



DESIGN FOR BAG

ART TEACHING IN NEW YORK CITY SCHOOLS.

The art department of the New York City schools has just issued its annual report on the work which has been accomplished in the city high schools. The report which has been prepared by Mr. James P. Haney, Director of Art, contains in addition to other material, a review of the last two years' work.

A study of the report shows how important and practical the art teaching in the high schools has become, and points to the many illustrations which emphasize the professional standards demanded. These appear in the commercial work in posters and advertisements which have depicted the beautiful in dress design and in the co-operative service of the schools with the toy associations and with other business organizations.

New York City claims the largest high school art department in the country and its 150 studios number more than the combined high school studios of Chicago, Boston and Philadelphia and three or four smaller cities. Nearly 50,000 children study art work in the first two years of high school, and several thousand more have been placed in special classes for the talented in the higher grades.

It is the purpose of the art department to provide for the training of all the children in taste, and to offer the gifted training in skill that will form the basis of technical work. It is desired, especially, to raise the standard of taste rather than to produce artists. In the opinion of Dr. Haney, a higher standard of taste means an advance along many lines. In this direction, the art teaching has been planned to have a practical relation to the business interests of the community. He shows in the report how many different agencies have been brought into co-operative relations with the several high schools. These include art museums, art societies, trade and social organizations. A supplementary organization called the School Art League is used for the formation and development of many museum courses and special art classes.

The extent of the popularity of these special courses in art for the talented may be shown by the rapid growth of the higher elective courses. These courses which were developed during the war in response to a demand for industrial training, caused a large demand for skilled workers. The value of this work has seemed to justify its existence thru the fact that the trade has constantly drawn upon the graduates of the high schools for its trained designers in industrial arts. Special courses are now offered in a dozen high schools and scores of students are trained in post-graduate work thru a scholarship plan. In the opinion of Dr. Haney, it outlines a saving scheme of real importance since it offers to gifted boys and girls an opportunity to cultivate that ability in art which they crave, while at the same time pursuing their high school course. The scholarship plan is recognized as having special value in directing the talented pupils into special channels where their talent will be of the greatest value to the industries, to the country and to themselves.

THE MINNEAPOLIS CONVENTION.

If there were any skeptics concerning the possibility of holding a great vocational convention in Minneapolis, they were thoroly convinced of their error before the meeting of the Vocational Education Association of the Middle West had really got far under way. This association is unique in at least two respects as regards vocational organizations. It makes the most complete recognition of agriculture as a vocational subject and it places commercial education in its rightful position among the vocational lines of work. A third aspect in which this organization has shown its keen appreciation of the modern trend of things is the emphasis which it has placed upon women's work.

The Twin Cities more than kept their promises. They always threw in something for good measure. They even arranged perfectly mild weather for the whole convention. The hotel facilities, while crowded to capacity by the large attendance, were nevertheless comfortable and well adapted to the needs of the convention. The commercial exhibits were adequately housed in unusually convenient and attractive quarters and the various meetings, luncheons, etc. were held for the most part in nearby rooms of the hotel. Some of the meetings, however, were arranged at school and church buildings within the immediate vicinity of the hotel.

The program, as had been freely predicted, proved to be the probable equal of any similar program ever presented in this country. It was participated in by many of the greatest experts in the various lines of industrial, commercial, agricultural, home economics, teacher-training, vocational guidance, and educational psychology to be found in this country and Canada. Selecting at random, the following names and topics will suffice to indicate the character of the program thruout: "What Girls and Women Should Know About Laws Affecting Their Employment," Agnes Nestor, Women's Trade Union League of America; "The Canadian Plan for Industrial and Technical Education," L. W. Gill, director of Technical education, Canada. "Directed Versus Indirect Acquisition of Skill in Typewriting," Harry D. Kitson, professor of psychology, Indiana University; "The Use of Mental Tests in Vocational Guidance," William M. Proctor, Leland Stanford University; "Fundamentals Underlying All Teacher Training," M. E. Haggerty, dean of the college of education, University of Minnesota; "What the Smith-Hughes Law Has Made Possible," Uel W. Lamkin, director for the Federal board of vocational education; "The Method of Social Science Teaching," Ruth Mary Weeks, Kansas City.

The high point of interest and enthusiasm during the whole meeting was probably reached at the annual banquet on Friday evening when three stirring and timely addresses were delivered by Dr. C. A. Prosser of Dunwoody Institute; Hon. Duncan Marshall, minister of agriculture, Province of Alberta, Canada, and Miss Ruth Mary Weeks of Kansas City. Three such addresses would set the pace for any convention of any group of educators.

Naturally, a vocational convention in Minneapolis would be incomplete without a visit to Dunwoody Institute, hence the visit was made by most of the members and visitors of the association. Besides this, there were visits to some of the various great milling and other industrial plants for which Minneapolis and St. Paul are widely noted. These trips added a most enjoyable feature to a program crowded with most enjoyable features.

Perhaps the credit for so successful a meeting should at least be shared with the numerous people who were wise enough and fortunate enough to attend the convention. However, the bulk of the credit belongs to the energetic, timely, and persistent efforts of the president, Prof. Edwin A. Lee of Indiana and to the same kinds and quantities of efforts by Mr. John M. Greer, assistant superintendent of schools, Minneapolis. They were aided at every turn, of course, by faithful workers whom they had selected to help carry the big undertaking to a successful conclusion. Among these were the same faithful men and women in and about Chicago who have always stood by the organization. Of course St. Paul, in the well known fashion of its splendid and capable leaders in educational affairs, joined hands heartily with the "suburb across the river," as one of them facetiously remarked, and helped to make the meeting a great success.

PROF. J. A. JAMES,
Madison, Wis.
President, Vocational Education Association of the Middle West.

This meeting probably drew the largest membership in the entire history of the organization. The "Great Northwest" showed its appreciation of such an opportunity at its very door and sent large numbers of its teachers to profit by it. By actual report, there was a surprising number of members whose expenses were paid by schools, cities, clubs, chambers of commerce, etc.

Besides the convention proper, there were two conferences on the preceding Wednesday evening. One was a conference on various phases of industrial education with Dr. Wm. T. Bawden in charge. The other was a conference on the preparation of commercial teachers for secondary schools. Unusually strong programs were presented in both of these conferences and the attendance was large. These meetings rather gathered the membership of the Association early and prepared the way for the opening of the main convention on time and with full attendance and a ready enthusiasm.

The officers for the next year were elected as follows: President, J. A. James, professor of agricultural education, University of Wisconsin, Madison; Vice-Presidents, Miss Cleo Murtland, University of Michigan, Ann Arbor, Mr. F. C. W. Parker, Chicago, and Mr. H. M. Appleman, South Bend, Ind.; Treasurer, Mr. James McKinney, Educational Director, American Correspondence School, Chicago.

The board of directors will be composed of Mr. Wm. Bachrach of Illinois; Ruth M. Weeks of Missouri; G. I. Barnes of Kentucky; J. N. Greer, Minnesota; Edwin A. Lee, of Indiana; Lewis Gustafson of Missouri; Chas. M. Yoder of Wisconsin; Jas. M. Early of Iowa; Alice M. Loomis of Nebraska and Jos. D. Bicknell of Michigan.

An Exhibition of School Projects. The Boys' Vocational School, at Albany, N. Y., had an exhibition of school projects in a large show window of the Capital District's leading hardware concern, during the latter part of March. The projects were all the work of the boys and represented the by-products in the learning of a trade.

Evening School Closing. The closing exercises and exhibit of the Vocational School at Albany, N. Y., were held on March 18th, at the Albany High School. The exhibit has always been a splendid success, demonstrating in a very practical way, the ability of both teacher and pupil.

NOW, ARE THERE ANY QUESTIONS?

This department is intended for subscribers who have problems which trouble them. The editors will reply to questions, which they feel they can answer, and to other questions they will obtain replies from competent authorities. Letters must invariably be signed with full name of inquirer. All questions are numbered in the order of their receipt. If an answer is desired by mail, a stamped envelope should be enclosed. The privilege of printing any reply is reserved. Address, Industrial-Arts Magazine, Milwaukee, Wis.

Furniture Polish.

166. Q:—I have read in the Industrial Arts Magazine from time to time splendid explanations and instructions for a rubbed varnish finish. In these articles, however, the final polishing was not discussed. What is the best polish for such a finish? Could wax be used with good results over rubbed varnish?

Could you inform me of any manufacturers who make exhibits that may be secured for use in a manual training or drafting room?—H. H. R.

A:—The final polish on a rubbed varnish finish should not be a wax. A wax sometimes is injurious to varnish and always leaves a sticky film which is hard to remove and as time goes on leaves a heavy bloom.

Following are variations of a commonly used formula for a final polish. It can be made up in small quantities.

Raw linseed oil	1 quart
Light golden oil	1 quart
Water	1 1/3 quarts
Mix these well and add acetic acid	1/2 pint
Wood alcohol	1/4 pint
Butter of antimony	2 ounces

A few grains of Bismark aniline will give it a nice color. The polish should always be shaken before using. This formula is taken from "Problems of the Finishing Room" by Walter K. Schmidt.

Another formula: For cabinet work, mix in a glass bottle thirty-two ounces by weight of raw linseed oil, eight ounces strong alcohol (spirits of wine), eight ounces of strong vinegar (or acetic acid), two ounces butter of antimony and eight ounces oil of turpentine. Shake the bottle well before using the polish and apply with a woolen rubber, using friction.

The best prepared polish which has come to the writer's attention is Ivory Cream Furniture Polish, made by the Waring-Bowerman Wood Finish Products Co., Syracuse, N. Y.

Plans for Canoes.

168. Q:—Can you furnish plans for phonographs and canoes?—R. A. D.

A:—Illustrations and plans for making phonographs have appeared in the Industrial Arts Magazine for November, 1919, page 466. You will also find illustrations and drawings in the Furniture Manufacturer and Artisan for September and October, 1918.

The making of a canoe was fully described with drawings in the Industrial Arts Magazine for February, 1918, page 50. The following books will be helpful to you: Manual Training Toys for the Workshop, H. W. Moore, $1, Manual Arts Press, Peoria, Ill.; Practical Boat Building, A. Neison, $1, F. J. Drake, Chicago, Ill.; Canoe and Boat Building, Stephens, $2, Forest and Stream, New York City.

Books on Saddlery.

171. Q:—Can you direct me to a book on saddlery?—E. P. VL.

A:—There is very little literature on the market concerning saddlery. The following books, however, are available: Harness Maker's Complete Guide, $2.50, National Harness Review, Chicago, Ill.; Harness Shop Estimate Book, $2.50, National Harness Review, Chicago, Ill.; Illustrated Guide for Harness Makers, Cutters and Apprentices, $1.00, The Harness World, Cincinnati, O.; Harness Making, by Paul Hasluck, 50 cents, Cassell & Co., New York City; Saddlery, by Paul Hasluck, 50 cents, Cassell & Co., New York City; Art of Making Harness Successfully, J. C. Jordan, $2.90, Tuskegee Normal and Industrial Institute, Tuskegee, Ala.

Wood Finishing.

178. Q: In manual training work I find that the proper finishing of wood is quite an art. There are several different things I would like to know more about and am submitting these questions to you.—W. E. T.

Q: Is acid stain or oil penetrating stain the best for walnut or mahogany finish on gumwood, birch, poplar and walnut wood?

A: By all means use the water or so-called acid stain for these woods. It is not practical nor desirable to use oil or spirit stains, especially on walnut, gumwood and birch, which are very active chemically and which cause the stain to fade out rapidly in the presence of direct sunlight. It is impossible to set an oil or spirit stain and thereby prevent its fading. The greatest disadvantage of all lies in the fact that an expert workman alone can produce a finish with oil stains, due to the muddiness of the finish and the quickness with which the color is lifted by the shellac or varnish coats, thereby rendering it streaky and unsatisfactory.

Q: Do any of the above woods require a filler and if so should it be used before shellac or after?

A: Any open pored wood as walnut, mahogany, birch should be filled, the latter, however, being a very small pored wood should be treated with a very thin filler. Some finishers maintain that it is unnecessary to fill birch, but where tested under practical conditions, a much finer finish has been produced with less varnish on filled birch than on wood not so treated. Following the application of the stain, it should be allowed to dry at least 24 hours in a warm room and without further treatment be given a sizing coat of shellac from stock goods, thinned so as to have about 2 lbs. of shellac gum per gallon. Most high grade shellac on the market is cut 4 lbs. to the gallon and should be purchased on that basis. As soon as the shellac coat is dried hard, it should be sanded very smoothly, preferably with a split 0000 sandpaper, then dusted off carefully and filled with a good silex filler which should be allowed to dry at least 48 hours before varnishing. This procedure is necessary in order to produce a perfectly clear, transparent finish, due to the following reasons. If the filler is applied to the stained wood without any sandpapering, following the stain coat, the wood will absorb oil from the filler as well as some fine pigment and the result will be a blotchy appearance with cloudy portions near any improperly sanded work. By filling after the shellac coat. the color is forced thru the whiskers which may be raised by the water stain, the dried shellac hardens the whiskers so they can be cut off with the paper to leave a hard, glass smooth surface, free from the grayish effect which occurs when stained work is sandpapered before shellacking.

Q: Do you consider one coat of shellac and two coats of cabinet varnish sufficient to give a first class finish?

A: Any experienced finisher with high grade materials can produce a very fine finish in two coats of heavy bodied varnish over shellac. For the grade shops, however, and trade schools, it hardly seems possible for beginners to get the proper surface in less than three or four coats and by a proper surface, I mean one which is as true and free from imperfections as high grade mirror plate.

Q: Is steel wool better than sandpaper for smoothing shellac and varnish? If not, what is the best number of sandpaper to use for shellac and for varnish?

A: A split 0000 paper is the best material for cutting shellac or varnish. Steel wool is all right on cheap work, but it is a very dirty material to clean up and is almost impossible to remove from the edges and moulding of panels and similar portions. Finishing paper in any 0 up to 10 may be purchased from sandpaper companies and should be bought as 0000 double surfaced finishing paper ready for splitting. The sheet should be torn into eight portions which are economically the right size for doing this kind of work. Each portion should be split in half so as to give two very thin sheets of sandpaper where but one formerly existed. Some finishers even moisten the paper back of the split paper in order to make it still more flexible, finding that this enables the sand to get down to the surface much faster and produces a more even cutting. The difference between sandpaper and steel wool lies in the fact that the paper tends to level up all inequalities whereas steel wool simply slides over the hills and valleys without rendering them level.

Q: Can gumwood be used successfully for cabinet work without danger of it warping or twisting?

A: The Kraetzer Cured Lumber Co., of Greenwood, Miss., can supply absolutely guaranteed stock. The ordinary gum stock on the open market is not to be trusted, since it is well known to the trade that gum is the trickiest of all woods to cure.—**Ralph G. Waring.**

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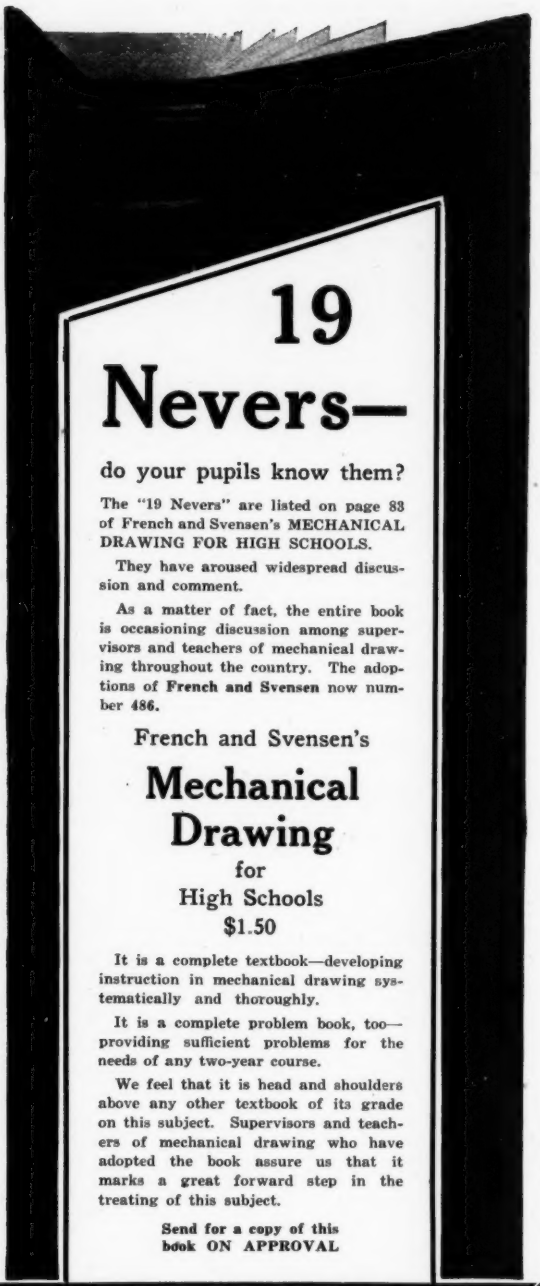
19
Nevers—
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The "19 Nevers" are listed on page 83 of French and Svensen's MECHANICAL DRAWING FOR HIGH SCHOOLS.
They have aroused widespread discussion and comment.
As a matter of fact, the entire book is occasioning discussion among supervisors and teachers of mechanical drawing throughout the country. The adoptions of French and Svensen now number 486.
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It is a complete problem book, too—providing sufficient problems for the needs of any two-year course.
We feel that it is head and shoulders above any other textbook of its grade on this subject. Supervisors and teachers of mechanical drawing who have adopted the book assure us that it marks a great forward step in the treating of this subject.
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School .....

Official Position .....

Ind. A. 4-1-21

SCHOOL CRAFTS CLUB MEETING.

The School Crafts Club held the first round-table of 1921 on February 19th at the Ethical Culture School, New York City. The discussions at the several tables were held simultaneously as in the past.

At the first table, Mr. Hugo B. Froehlich led in the discussion of linoleum block printing as a problem for the art department. Mr. Froehlich demonstrated a new printing press, made by boys in the manual training department and used by the drawing teacher in class. Linoleum blocks were used in producing color prints.

At the second table, the topic was toy making, with Mr. John Gittinger, and Mr. Thomas C. Anskis of New York, as leaders. These men gave the members present the benefit of their practical ideas on the subject of toys as projects. Mr. Gittinger had an interesting exhibit of models and Mr. Anskis showed some fine drawings of animals for use in toy making.

Problems in methods of arousing and maintaining interest occupied the time at the third table, which was in charge of Mr. Richard K. Campbell of Trenton, N. J.

The club has recently added a new departure in its meetings in the form of a so-called "forum," in which are discussed difficult problems which confront teachers. These discussions will be in charge of a group of men experienced in the handling of these subjects and who are recognized as leaders in their particular lines.

NEWS AND NOTES.

Design Art Calendar. The art class of the Stevens High School, Claremont, N. H., recently completed the designing of a school calendar. The designing and tinting work were all done by the students. The calendars were offered for sale to the public.

Trade School Shops Installed. All seventh and eighth-grade boys and girls at Akron, O., spend one-half day a week in prevocational shopwork. Girls take cooking and sewing and boys have a wide range of courses from which to choose.

The schools are grouped into units; for example, one school takes care of all classes in printing, another of sheet metal and another of electricity. Each teacher handles from five to six school groups, making the arrangement an economical one in both money and time.

The plan aims to give each upper-grade student one semester in each of the four shops, in order that he may have a practical working knowledge of the actual shop methods. The knowledge forms the background for his vocational choice when he finally enters high school.

Trade School Attendance Grows. The attendance at the trade school in New Britain, Conn., has increased about 180 per cent, according to Director H. S. Hall. Forty-eight students are enrolled in the "teach your trade" course.

Art Work Exhibited. An interesting exhibition of art work from the New York City schools was shown recently at the High School Library, New Haven, Conn. The work included a number of examples of the Washington Irving High School and showed how the pupils are carried thru an intensive course of drawing, followed by work in color and drawing.

Jewelry Building Dedicated. The new jewelry building at the Rhode Island School of Design, at Providence, was dedicated with appropriate exercises in January. The occasion was also celebrated as the twentieth anniversary of the establishment of the jewelry department in the institution.

Training School Opened. A government training school for former service men has been opened at Nauvoo, Ill., with an initial enrollment of 23 service men. The school which is the second of its kind to be established, has sixteen teachers, nurses and a Red Cross worker.

Vocational Training Offered. Columbus, Ga., claims to be the first city in the state to establish vocational training under the Smith-Hughes law. Provision has been made for night classes in carpentry and machine shop work.

To Teach Masonry. A course in masonry in the Detroit, Mich., schools is planned. The course owes its establishment to the Masons Contractors' Association of the United States and has for its purpose the training of young men for the bricklaying trade.

(*Continued on Page* XXIV)

TOOL INFORMATION THAT YOU CAN USE

DISSTON educational literature is in use in manual training schools in all parts of the country as text books. We have prepared these books for educational work of this kind and believe you can find many things of value in them. Here is a list of those more commonly used, and a brief explanation of their contents:

The Saw In History—a description of the development of the saw from the days of the prehistoric stone saw to the efficient, fast working steel tool of today. The second part of the book contains a discussion of all the many types of modern saws and their use.

The File In History—One of the first files was a hollowed out stone. The development of files from that date to this is an interesting story. The many kinds of files and their uses are also described in this book. We believe "The File In History" is the first book covering this subject.

Why A Saw Cuts—Have you ever attempted to describe the exact reason why a saw will cut thru wood or metal? This operation is clearly and interestingly explained in our booklet.

How A Disston Saw Is Made—There are more than eighty operations required to make a Disston Hand Saw—these are described in this booklet on our manufacturing process.

Disston Saw Chart—A chart illustrating and describing different saws. A large poster that can be seen easily and gives the student a very good idea of the different kind of saws.

Disston File Chart—The important shapes of files and styles of teeth are illustrated on this chart. The chart is made in poster size.

Farm Book—Saws and tools used on farms are described in this book. A very interesting tool book to be used in connection with agricultural study.

We are glad to supply these books free of cost to instructors. If you have not seen them, we suggest you write to us at once for sample copies.

HENRY DISSTON & SONS, Inc.

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DISSTON

SAWS AND TOOLS

Wiley Technical Series Books

To Be Issued During April and May

MATHEMATICS FOR SHOP AND DRAWING STUDENTS

By H. M. KEAL and C. J. LEONARD,
Cass Technical High School, Detroit, Michigan.

MATHEMATICS FOR ELECTRICAL STUDENTS

By H. M. KEAL and C. J. LEONARD.

THESE two books were prepared from notes used with gratifying results at Cass Technical High School, Detroit, an institution of country-wide reputation with over 6000 students. The theoretical parts of the two are identical, but the first-named has applications from the shop, while the second-named has applications from electrical work. They are **not** shop or electrical texts, but are **mathematical books,** giving, besides a **knowledge** of mathematics, an **understanding** of this essential subject which will increase the student's practical working knowledge.

"Mathematics for Shop and Drawing Students" will be published early in April, while **"Mathematics for Electrical Students"** will be ready sometime in May.

PREPARATORY MATHEMATICS FOR TECHNICAL STUDENTS

By HAROLD B. RAY and ARNOLD V. DOUB,
Cass Technical High School, Detroit, Michigan.

A PRACTICAL preparatory course for students wishing to enter shop or laboratory classes. The subject is treated from a practical and technical viewpoint, and trade problems are given.

"Preparatory Mathematics" will be issued during April.

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If I decide to keep these books I will remit their prices. If not I will return them after ten days, postpaid.

Name .....

Address .....

If teacher, state school .....

If not teacher, give reference .....

I-AM 4-21

(*Continued from Page* XXII)

Federal Aid for Industrial Education. The New Mexico plan for the establishment of industrial rehabilitation courses for men and women has been approved by the Federal Board for Vocational Education. Federal aid to the amount of $5,000 will be given by the government.

Trade Teachers Graduated. A class of 26 was graduated from the teacher training classes of the School of Education, at the Cleveland Normal School recently. The class was the first to complete the prescribed course necessary for graduation. The work covers two years, of 32 weeks each. Classes are held two evenings a week for two-hour periods.

Jewelry Designs Awarded First Prize. Mrs. Janet P. Bowles, a teacher of jewelry at Shortridge High School, Indianapolis, Ind., for the second time in ten years, has been awarded the first prize for articles designed by her. The prize was awarded by the London and Paris Jewelers' Association which holds a contest once every five years.

Technical School for Girls. A technical school for girls in the loop is planned by the Chicago board of education as soon as building conditions become normal. It is planned to erect a special building for the school at a cost of $1,000,000. Day and evening classes will be conducted under the direction of women teachers.

An Exhibit of Sewing. An exhibition of sewing was held recently at the Junior High School, Linwood Ave., in Bridgeport, Conn. The exhibit included blouses, dresses and other articles made by the girls in classes.

Vocational Guidance Bureau Proposed. The board of education at Newark, N. J., plans the establishment of a bureau to give aid to girls in vocational and continuation schools.

A Part-Time Vocational School Planned. The school board of Minneapolis, Minn., is planning the establishment of a vocational training school to give part-time instruction to children who are employed. Prevocational and manual training courses in the high schools are to be distinctly separate from the trades course in the vocational school. Manual training courses in the elementary schools will be continued as a necessity to a well rounded course of study.

Designing of Wearing Apparel. The art department of the public schools of Louisville, Ky., has undertaken the designing of frocks, suits and laces under the direction of the supervisor of drawing. A study of form is made the basis for the instruction.

Pioneer School Needs Funds. The Sloyd Training School in Boston, which was established by the late Mrs. Quincy Adams to demonstrate the value of manual training, is in need of funds to place the institution on a sound basis and to permit a continuance of the good work being done. As a result of the good work done at the parent school, other schools have been established in various parts of the country, and the influence of its work has extended even to Mexico and Cuba.

The purpose of the directors of the school is to obtain sufficient funds for establishing a corporation to manage the school of sloyd and to include more directly the occupation thereapy department.

The Pennsylvania Museum and School of Industrial Art held during the month of February a furniture exhibition to illustrate the history of the development of furniture. The exhibits included historic as well as modern pieces.

Beginning February 21st and continuing to March 12th, the Museum held an exhibition of pottery and tile work. The progressive stages of making pottery as well as a considerable amount of completed pottery was shown.

Issues Art Calendar. The School Art League, of New York City, has issued its calendar of spring art meetings, which are all held on Saturday and are fully illustrated with lantern slides and drawings made before the audience. The meetings are arranged in groups, comprising lectures for members and juniors, exhibition gallery tours, talks for elementary pupils in Manhattan and in Brooklyn boroughs. The League has also issued its tenth annnal report, showing what the league has done in aiding the conservation of talent, that the children may be prepared for the constructive work of tomorrow. Among the features espe-

(*Continued on Page* XXVII)

(*Continued from Page* XXIV)

cially touched upon in the report are the lectures for children and members at the Metropolitan and Brooklyn museums, the work of the docent in reaching 39,000 young people, the awarding of 25 industrial scholarships to graduates of the high schools, the Saturday morning class in drawing, the awarding of fine craftmanship medals, and the work of the alumni in aiding the young people who require the help of the league.

An Occupational Survey. An occupational survey of boys and girls who are students at the Albany (N. Y.) part-time school has been made by the faculty of the school, in cooperation with the director of vocational education and the state specialist in part-time commercial education. The purpose of the survey was to obtain definite information on the occupational history of each student and to furnish the kind of training which the students need to best fit them for their work.

A Part-Time Business Course. A new business course has been inaugurated at the part-time school, at Albany, N. Y. The course includes business writing, office or business practice, English, local commercial geography and typewriting, and the students attend one-half day a week, either morning or afternoon. The course is in charge of Mr. James L. Fitzgerald.

A Course in Foundry Work. The West High School, at Salt Lake City, is offering a ten weeks' course in foundry work. Some of the practical work which has been done includes gears of various sizes, face plates and iron blocks for use in the welding department.

To Complete Technical Additions. It is expected that the new additions to the technical building of the West High School, Salt Lake City, will shortly be completed. Equipment valued at $15,000 has been provided for the building.

Art in Clothing. A study of the relation of line and form, color and composition as applied to dress has been made by the home making classes at Duluth, Minn. The work includes elementary dressmaking, adapted problems, costume design and ornamentation.

New Course in Industrial Arts. The industrial arts department of the Corvallis (Ore.) high school is offering a course in house painting. A class of seven boys is taking the work, which includes a good deal of practical painting around the high school.

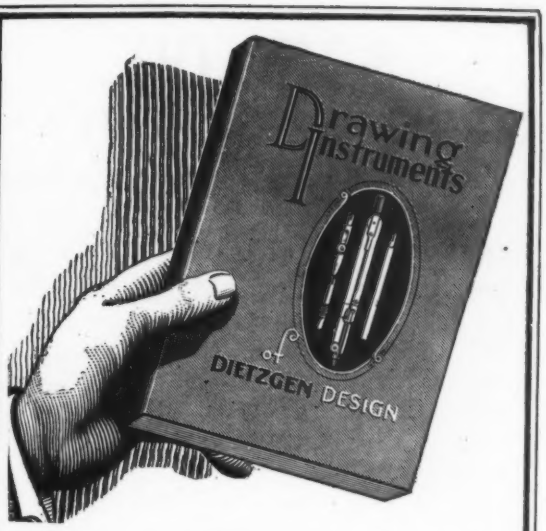
New Courses at Lindsay, Calif. New courses in automobile mechanics and forging are planned for the high school when the new building is ready. Mr. B. B. Rearden is instructor of manual training.

Manual Training at Juneau, Alaska. The work in manual training for the ninth grade has included practical carpentry on a small scale. Two model bungalows have been erected, as well as problems in the way of water wheels, windmills and towers. More recent work of the class has included trestle and bridge building. It is planned to arrange and construct a model farm location, with bungalow home, windmill, a water wheel, barns and silos. The manual training work is in charge of Mr. A. B. Phillips.

International Congress of Home Economics. An international Federation of Home Economics Teachers has been organized for the purpose of encouraging the development of home economics instruction in all countries thru cooperation with public agencies, scientific and professional organizations and individuals. The membership includes official representation of governments granting an annual subsidy as well as individuals, institutions, associations and organizations interested in home economics.

The federation has four governing bodies comprising the plenary assembly, the permanent international committee, the executive committee and the international office of home economics instruction. Membership in the Congress consists of delegates from the governments, municipalities or institutions paying a fee, and of individuals registered with the local committee who have similarly paid a fee.

It is planned to hold an international congress of home economics instruction at Strasbourg, Thursday to Sunday, July 28-31, inclusive. The American Home Economics Association, also a member of the Federation, will be represented at the forthcoming Congress this summer.



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PRIZES FOR TOYS

A National Contest To Encourage The Making of Artistic Toys

For Boys and Girls in Grammar Grades

ONE of the most practical problems in Industrial Art for Public Schools is the making of Toys. Many children get their first realization of the "use" as well as the "beauty" of Art in their attempt to make Toys.

In order to encourage Toy Making for its educational value, we are offering the following Prizes for "the most Artistic and Practical Toys" designed and made by boys and girls.

1—1st Prize.....	$ 25.00
10—2nd Prizes, each...	10.00
20—3rd Prizes, each....	5.00
25—4th Prizes, each...	1.00
Total of 56 Prizes.	$250.00

CONDITIONS: Any boy or girl in the fifth, sixth, seventh, or eighth grade in any Public School is free to compete. The Toys sent in must have the O.K. of the Supervisor of Art, or the Grade Teacher. A better plan would be to have a local contest of Toy Making and only the Prize Winners entered in this National Contest.

Toys may be action Toys or stationary, and made of wood or metal. The only condition is that the Toys MUST be decorated with "Enamelac," the Air-drying Waterproof Art Enamel. A "Color Card" and circular of "Enamelac" will be sent free on request of Supervisors of Art or Teachers, by The Prang Company.

Help Make American Toys Beautiful

A copy of the last issue of "The Prang Bulletin" giving illustrations of "How to Use Enamelac" will be sent free to any teacher. All Toys should be marked with the NAME, SCHOOL and ADDRESS of the maker. They should be carefully packed to insure safe arrival, and be sent to the following address before June 1, 1921. The Prize Winners will be notified by mail and full announcements made in the September Educational Magazines. Watch for the Prize Winners! Send all Toys for competition to

THE PRANG COMPANY, 1922 Calumet Ave., Chicago

Annual Exhibit at Pratt. Thursday evening, March 10th, was observed as visitors' night at the School of Science and Technology of Pratt Institute, Brooklyn. The shops, laboratories and classrooms were open to visitors and a large number of persons took advantage of the opportunities afforded by the exhibit. The institute plans to modify its present courses and to introduce new courses suited to the rapid changes now taking place in the field of industrial education.

Offer Cash Prizes. The American Humane Association has arranged for a poster contest to be held in the schools of the United States. Posters will be received from four classes of children: I. Children in grades 1, 2, 3, 4; II. Children in grades 5, 6, 7, 8: III. From pupils in high and preparatory schools; and IV from art students and persons of any age.

In each class, the first prize will be $25; the second prize $15, and the third prize $10. Complete details may be had by sending a stamp to the Poster Department of the American Humane Association, Albany, N. Y.

The Department of Industrial Education of the Virginia Polytechnic Institute, under the direction of Professor B. H. Van Oot, has recently extended its field of work to include training for men and women who desire to become employment managers and personnel workers in industries. Courses, also, for the training of linotype operators, machinists, woodworking machine operators, electricians, carpenters, moulders, and printers have been added to the courses already given. The college is especially well equipped to handle these lines of work inasmuch as it owns and operates the electric power and light plant of the town, has extensive commercial shops for machine and wood work, and by September will have a well equipped up-to-date printing industry. Mr. M. H. Eoff, manager of the Montgomery Messenger, has been engaged as manager of the printing department and will engage an experienced linotype operator and printer as instructor. Two-year courses in the Mechanic Arts will be given for beginners, and short unit courses for those already engaged in a trade.

Vocational Department Expands. Albany, the capitol of New York State, has a school system that during the past three years has been expanding by leaps and bounds. The vocational department has almost doubled the teachers' salaries, has secured the attendance of practically every teacher at some college during the summer, has established a part-time school for working children, and evening vocational schools for men and women.

Announce Gift. The Corcoran Gallery of Art at Washington, D. C., is the recipient of a gift of $100,000 from former senator, Wm. A. Clark of Montana. The proceeds of the funds are to be used in providing annual prizes in competitions.

Schools Train Executives. The Western Electric Company is maintaining evening courses at the several branch plants for nearly 1,500 employes who attend classes regularly each evening.

The attendance of employes is voluntary only. The records of the classes at the factory near Chicago show an enrollment of 962 employes for the past term. Courses in telephone practice, mechanical drawing, mathematics, sewing, comptometry, electricity, English, accounting, production, and manufacturing principles are offered.

It is evident that opportunities for advancement thru special training appeal alike to operative, engineer, clerk and salesman. A total of 322 members of the engineering department use their spare time for study along definite lines. Particular interest has been manifested in the course for machine switching, a subject which has become of vital importance with the introduction of the automatic telephone. The principles of direct and alternating currents, and shop mathematics, appeal to the embryo executives as specially desirable. Classes in accounting and general routine in business are conducted at the offices of the company in New York. with 110 men enrolled from two metropolitan offices. Five classes have been organized and are being conducted for the benefit of these students.

In all the work, the directors demand constant application. Classes are conducted as a part of the company's policy to train men for promotion in the lines of adminis-

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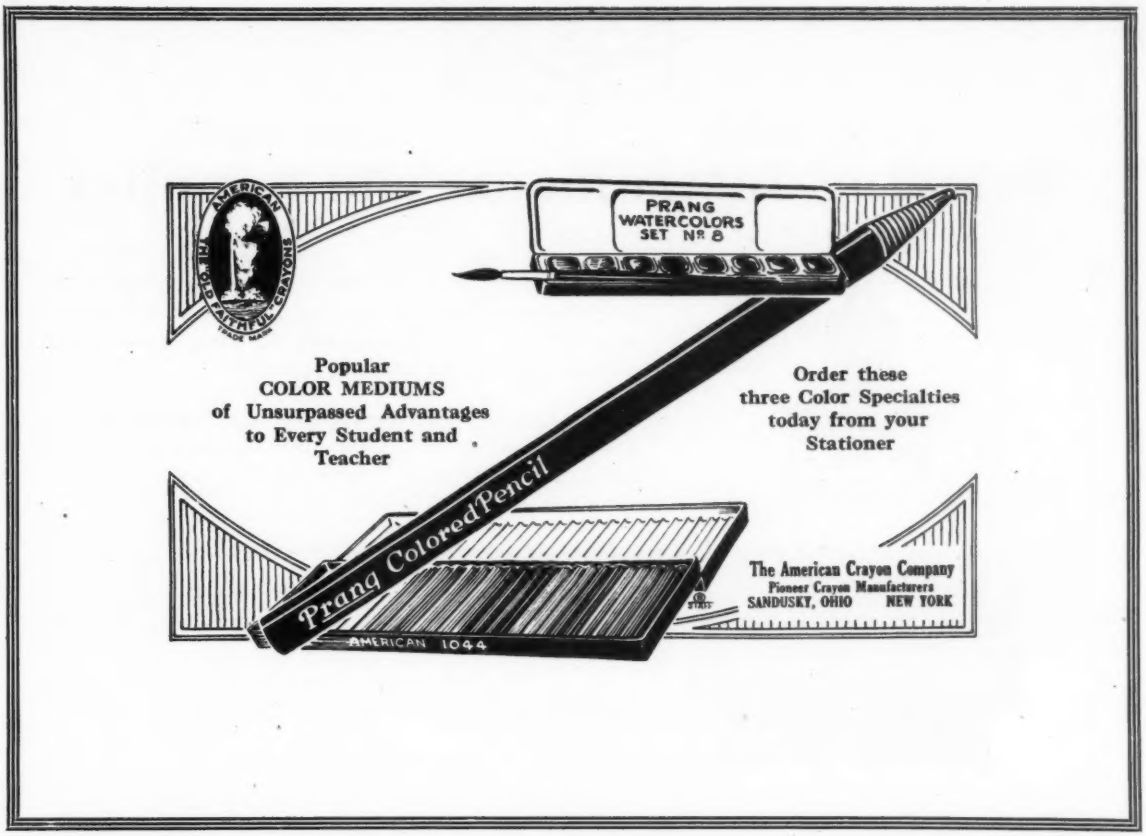


(*Continued from Page* XXVIII)

tration, mechanics or other fields of work connected with the business of the Company.

Seattle, Wash. A prevocational class has been established at Broadway School for boys of the eighth grades who are too old for grammar school and who do not do satisfactory grade work. The class is composed of twenty students who devote half of the time to work preparatory for a vocation. The work is all adapted to the development of each individual student.

The Public Education Association of New York City, in one of its recent weekly circulars, devotes considerable space to the work of the art department in the city high schools. The association has just completed a study of the industrial arts work of the high schools and its members maintain a healthy interest in the work of the high schools.

Conference of Continuation Instructors. A conference of continuation school authorities was held February 4th, at the State House, Boston, Mass., with Deputy Commissioner R. O. Small in charge. The conference which discussed problems connected with the present unemployment situation and the continuation schools, was attended by teachers, directors and school superintendents from nearly all of the 44 cities and towns of the state.

The conference discussed generally the ways and means for carrying on continuation school work and one of the important problems was the effect of the operation of the law in force since September. With the greatly reduced number of juveniles now employed, the problem is to take care of them in the schools on a twenty-hour basis. In some of the cities they have neither the classroom facilities nor the requisite teachers to teach.

The Association of Continuation Teachers in the state was effected last summer at Hyannis. Mr. James Dugan is acting president of the association, and Miss Gertrude Tracy is secretary.

New Courses at Los Angeles. Manual training work at Los Angeles, Calif., has been broken up into separate vocational units, embracing woodwork, sheet metal, gas engine construction, elementary electricity and printing. About seventy Smith-Hughes vocational classes have been organized for the year, with prospects for the opening of cooperative classes. About $25,000 worth of equipment have been installed in the school shops.

At Minneapolis it has been proposed again to close the girls' vocational high school. A storm of protest has been raised. The school authorities plan to distribute the vocational work to four sections of the city.

At Washington, D. C., it is proposed to add printing as one of the studies of the vocational department of the schools.

Industrial Education Expanded. Industrial trade education at Woonsocket, R. I., has been expanded to meet the needs of men employed in the building and machine trades.

Open Sixth Prevocational School. The Chicago board of education is planning the establishment of a sixth prevocational school in the Throop Building, to accommodate 400 students. The schools are for the benefit of students who have fallen behind in classwork and are at work during portions of the day.

Plan Metal Working Shop. Supt. Darrell Joyce of Hamilton, O., has recommended that the board establish a course in metal working. The estimated cost of the course is $700.

THE CONSTRUCTION OF FLOOR LAMPS.

To the Editors:—

Your March issue just received and the method of making floor lamps was of interest. I wish to state my method of turning floor lamps, which the boys have made for the past three or four years.

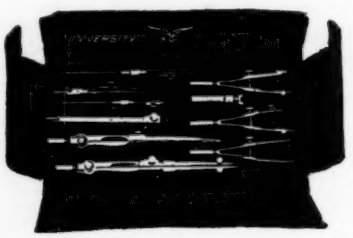
Since the lathes are all of one design, I disconnect one and reverse it in a straight line with the first. By reversing the tail stock and fastening the lathe to the floor, we have one long lathe. I have just finished four May-poles for the playground association and they were four inches square and twelve feet long.

I consider the design to be capable of improvement, but this cannot be done by making a number of short pieces as illustrated on page 116.

Middletown, Ohio, Feb. 23, 1921. E. F. JUERGENS.

POST'S

Drawing Instruments and Supplies



On receipt of your name and address we will send you by return mail a copy of our new illustrated catalog of "American" and "Overseas Brand" of Drawing Instruments, a sample bottle of Post's Waterproof Drawing Ink and a sample book of Post's Drawing and Tracing Papers.

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PUBLICATIONS.

Issue Key-Plates. A series of key-plates to the well-known text "Mechanical Drawing Problems" by Berg and Kronquist, has recently been put on the market by the Manual Arts Press, Peoria, Ill.

The plates are in shape of blueprints showing the complete and correct solution of every problem in the book. The books are essentially a teacher's and supervisor's reference book and should serve to set a much higher standard in this branch of education. Incidentally, the plates are excellent examples of good draftsmanship and afford the instructor or supervisor a standard toward which he and his classes should strive. The plates sell at $2.80.

Home Economics Courses for Junior High Schools. Home Economics Circular No. 9, 1920, U. S. Bureau of Education. It is the consensus of opinion that in the first four years of the elementary school, both boys and girls should be given progressive instruction in industrial arts. The pamphlet discusses time allotment, elective courses, and outlines of courses. All of the courses are intended to be suggestive. It is anticipated that the intelligent teacher will modify, eliminate or substitute projects as the needs of the pupils justify changes.

A Course in Woodwork. Prepared and issued by the Robidoux Polytechnic School, at St. Joseph, Mo. The wood working course which embraces a study of woods, tools and their uses, paints and finishes, building construction and simple drafting, is designed to serve boys interested in preparing for some phase of wood construction, and for general students who wish to gain a knowledge and experience in wood work and the use of tools. The cover of the pamphlet which has been printed by the students of the printing department, is reproduced in the natural color, direct from an oak block prepared in the woodshop.

First Biennial Report of the State Board of Vocational Education, Boise, Idaho, January, 1921. Melvin S. Lewis, Director. It includes a brief discussion of accomplishments in vocational education for agriculture, trades and industries, and home economics, and sets forth the results in teacher-training and supervision for each of these lines of work.

PERSONAL NEWS.

Mr. Carl W. Talbot has been appointed instructor in manual training at Milford, Mass., to succeed Mr. P. B. Kendall. Mr. Kendall has accepted a position with a shoe last company in Manchester, N. H.

Mr. Edward Riley of Green Bay, Wis., has been appointed Director of the Vocational School at Oconto. Mr. Riley is succeeded at Green Bay by Mr. Charles E. Peterson.

Miss Eleanor Mitchell of St. Cloud, Minn., has been appointed to the recently created office of Vocational Counsellor, Junior Division, U. S. Employment Service, St. Paul. Miss Mitchell will have charge of the placement of boys and girls in wage-earning positions for which they are best fitted.

Mr. John M. Morehouse has been temporarily appointed to the industrial arts department at the East Side High School, Albany, N. Y.

Miss Margaret Steele Anderson, art critic and author, died recently at her home in Louisville, Ky., at the age of 52.

Miss Anderson had conducted a course in painting and architecture at the University of Louisville for several years. She was the author of two books, a volume of poems and a volume on "How to Study Painting." She was a member of the local art club.

Prof. W. T. Carrington has announced his resignation as Director of Vocational Education for Missouri.

Mr. H. N. Seney of Meridian, Miss., has been made assistant state director of trades and industries.

Mr. George E. Freeman has been appointed as placement officer for the Federal Board of Vocational Education for District No. 2, which includes New York, New Jersey and Connecticut.

Mr. A. R. Lorenger, formerly in the apprentice school of the Ford Motor Co., Detroit, Mich., has been re-elected Director of Industrial Drawing in the Smith-Hughes Classes of the Western High School, Detroit.

China Colors
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NEWS OF THE MANUFACTURERS

OFFERS PRIZES FOR TOYS.

The Prang Company of Chicago has announced a prize competition in toy making for the purpose of stimulating an interest in the subject in the several schools and to help make art work interesting and practical.

The firm offers a total of 56 prizes, with a value of $250, for the most artistic and practical toys designed by boys and girls in the fifth, sixth, seventh and eighth grades of the public schools.

The contest which is national in extent, is open to any child in the designated grades of the public schools and toys submitted must have the approval of the teacher or supervisor before being sent to the Prang Company. It is also required that the toys be decorated with "enamelac," the air-drying enamel manufactured by the firm.

NEW OLIVER SAW BENCH.

The Oliver Machinery Company of Grand Rapids, Mich., has issued a circular describing its No. 80 Variety Saw Bench, which is designed and built to meet modern demands in the production of woodwork, wood patterns, furniture, talking machine cabinets, and other high grade woodwork.

The machine may be either belt driven or motor driven. It is designed to do ripping, cross-cutting and dadoing and will cut a perfect miter. It is supplied with one 14-inch miter saw, one plain ripping fence, two miter gauges, one yoke for connecting the universal gauges, filling strips for slots in table, one automatic saw guard, belt guard and steel blade slitter, two stop rods, a dado sleeve and a self-contained countershaft and wrenches. All parts are interchangeable.

The machine should prove valuable for use in technical and manual training schools where a great deal of woodwork and cabinet work is turned out.

Purchase New Building. The Kroma Color Company, of Sandusky, O., has purchased the six-story, fireproof building of the Hinde & Dauch Paper Company to replace its own outgrown plant on East Market Street. The new building provides more than seven times the floor space of the old plant and includes a modern printing and paper box department and some metal work equipment.

The American Crayon Company some time ago purchased a half interest in the Kroma Color Company and now owns the business in its entirety. It is expected that with the new facilities, equipment and organization that prompt and efficient service will be given to all customers. Mr. John K. Britton, secretary-treasurer, will continue in charge of the plant as manager of the printing and box department.

A Handy Catalog. The Modern Engine and Supply Company, 342 Monadnock Block, Chicago, Ill., has just issued its 1921 catalog of simple gas and steam engines and engine castings. This will be of interest to schools which conduct machine shops and courses in gas engine operation and repair.

The catalog includes a long list of utilities for the machine shop and for the model maker.

Open New Office. The Chicago Flexible Shaft Company, manufacturers of the well known Stewart Furnaces, for heat treatment of metals, have opened an office in Detroit, at 601 Kerr Building. The new office will serve southern Michigan, northern Indiana and northern Ohio.

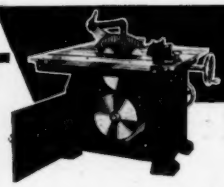
TEACHERS OF MANUAL TRAINING WANTED.

An examination for teachers of manual training in elementary schools will be held in the Central Commercial and Manual Training High School of Newark, N. J., on Saturday, April 9th, at 9:00 A. M.

The examination will cover history, principles and methods of teaching manual training, mechanical drawing and structural and decorative design. A practical test of the candidate's technical ability consisting of the working out of shop problems, will be made.

The salary ranges from $1,600 to $2,400, according to experience and fitness, and a general increase of about $200 is planned for next year.

Candidates for the position are asked to make application not later than March 26, to the Superintendent of Schools, at the offices in the City Hall.



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We invite all our readers to ask questions of any kind on any problem of Industrial Arts, and we promise to answer them fully and promptly. If we must, we shall investigate specially, charging the trouble and expense to our editorial appropriation.

If you are interested in the purchase of any of the items listed below, or if you want catalogs for your files, do not hesitate to check this list and mail it to the address given below:

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Cement
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Chair Seats
Chisels
Chucks
Clamps
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Cobbling Outfits
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Countersinks
Crayons
  Chalk
  Wax
Cupolas
Cutlery
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Drills
Drilling Machinery
Drill Presses
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Sawsets
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Saw Rigs
Saw Tables
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Try Squares
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Wrenches

INDUSTRIAL-ARTS MAGAZINE, Milwaukee, Wis.

Gentlemen:—We are interested in the items as checked above. If you will place us in touch with manufacturers you will be of help to

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